



Deval L. Patrick, Governor  
Richard A. Davey, Secretary & CEO  
Frank DePaola, Administrator



604428 – 14

SEPTEMBER 12, 2014

**ADDENDUM NO. 4**

To Prospective Bidders and Others on:

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue over the MBTA Railroad**

**BIDS TO BE OPENED AND READ: TUESDAY, SEPTEMBER 16, 2014 at 2:00 P.M.**

Transmitting changes to the Contract Documents as follows:

**RESPONSE TO CONTRACTOR QUESTIONS**

13 Pages Attached

**DOCUMENT 00010**

Revised Pages 1 & 2

**DOCUMENT 00102**

Revised Pages 1 & 2

**DOCUMENT A00801**

Revised Pages 3, 8, 87, 120.

**DOCUMENT A00803**

Revised Pages 7.9 to 7.20

**DOCUMENT A00808**

Revised Pages 3 thru 8

**DOCUMENT B00420**

Revised Pages 21 & 27

**DOCUMENTS A00810 & B00841**

Inserted new Documents

**DRAWING REVISIONS**

Revised Sheets 15, 71, 72, 75, 76, 77, 191, 212

Please take note of the above, substitute the revised pages for the originals, insert the new pages, and acknowledge Addendum No. 4 in your Expedite Proposal file before submitting your bid.

Very truly yours,

Frank Kucharski, P.E.  
Construction Contracts Engineer

Jb & J. Pavao, Project Manager

**CHELSEA**  
**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Questions from Barletta Companies Dated 09/05/2014 @ 4:40 PM:  
and Dagle Electrical Construction Corp. Dated 09/08/2014 @ 7:02 AM**

**Question 39)** Please identify the manufacturer of the Sonet multiplexer shown on drawing sheet #217 (communication rack detail 4) for each station. This is also mentioned in PAS Variable Message Sign spec 16770; paragraph 1.2 D as an existing High Street connection to the DCAM building at 200 Arlington Street in Chelsea. Manufacturer and model required for pricing.

**Response 39)** It is possible that sufficient dedicated fiber communications pathways will be identified in order to eliminate the requirement for a multiplexing switch (fiber infrastructure configuration is being finalized in coordination with MassDOT-IT). For pricing purposes, assume furnishing, installing, and configuring one Huawei Optix OSN 1800 DWDM/CWDM band hybrid multiplexer. This equipment requirement may be modified at a later date.

**Question 40)** Drawing Sheet 217- General notes 1 & 4 Indicate both a primary and secondary video storage bank. Specification section 16840 page 22 paragraph 2.20, B says the Video storage is existing. Please clarify if both Primary and Secondary storage is to be furnished for this project.

**Response 40)** The Contractor shall furnish and install new primary and secondary CCTV storage. Secondary storage shall be installed in MassDOT-MBTA's existing data facility at 45 High St. in Boston.

**Question 41)** Please identify the Raid configuration for the storage devices ie. Raid 5, 6e, 6x.

**Response 41)** The required RAID configuration is RAID 6e.

**Question 42)** Please identify the number of days of storage required for both the primary and secondary video storage banks.

**Response 42)** The minimum storage requirement shall be calculated based on 8fps at 720p resolution, with 100% motion in a complex environment, for a minimum retention rate of thirty (30) days.

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue over the MBTA Railroad**

**Question 43)** Drawing Sheet 264 shows the top 2 courses of Granite block darkened. Is this new New Block? Existing Block? Or Cast in place Concrete with Formliner? The moment slab Details on Sheet 265 don't appear to match the Elevation on Sheet 263

**Response 43)** The top 2 courses are darkened to represent Cast in place Concrete with Formliner which will be cast integrally with the moment slab.

**Questions from Dagle Electrical Construction Corp. Dated 09/08/2014 @ 7:02 AM:**

**Question 45)** The CCTV specification 16840 2.10, E. calls for tamper alarms on pole cabinets to be connected to the camera input to detect and notify the MBTA via the Vidsys PSIM. Given Vidsys is not currently capable of processing these alarms directly would an alternate method of processing these alarms directly would an alternate method via the Lenel/Vidsys system be acceptable?

**Response 45)** Alternative configuration of cabinet tamper alarm inputs through the Lenel/Vidsys system shall be acceptable, provided the following:

- A. Any additional cable, conduit, and AECS hardware needed to support the proposed configuration shall be included in the Contractor's bid proposal.**
- B. Any additional cabling required to support the proposed configuration shall be installed in a separate conduit section of the busway communications duct bank, while maintaining compliance with NEC standards.**
- C. All copper cabling utilized in the proposed configuration shall be electrically isolated from communications enclosure equipment through the use of surge (lightning) suppression devices**

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Questions from Atlantic Bridge & Engineering, Inc. Dated 09/08/2014 @ 10:07 AM:**

**Question 46)** The Specifications for the steel piles for Wall No.'s 1 thru 4 indicate that the material is to conform to the relevant provisions of Section 960 of the Standard Specifications (Ref. Page A00801-250). Please clarify what provisions of this specification section are applicable to the fabrication of the steel piles for this project. (e.g. Preblast of raw steel materials prior to fabrication? Does work need to be performed by MassDOT approved fabricator?)

**Response 46)** Refer to both the Standard Specifications and the Supplemental Specifications dated June 15, 2012. For requirements for steel sources refer to subsection 960.40. For shop drawing requirements refer to subsection 960.60. The piles are rolled sections, so they need to be by approved fabricators. For fabrication, including approved fabricators, refer to subsection 960.61 (for a list of approved fabricators, see MassDOT website at [www.mass.gov/mhd](http://www.mass.gov/mhd)). The piles are galvanized, with exposed surfaces painted, so they need to conform to subsection 960.63.

**Question 47)** Reference is made to Contract Sheet No. 194 of 346. Please provide the size of the headed shear connectors that are to be installed to the steel piles for Wall No.'s 1 to 4.

**Response 47)** The headed shear connectors shall be ¾" A307 studs, 4 inches long. Also refer to the MassDOT Bridge Manual for additional details on Stud Shear Connectors.

**Questions from Intelligent Systems & Controls Contractors, Inc. Dated 09/08/2014 @ 2:36 PM:**

**Question 48)** The PA/ESS Section includes the following paragraph "Designated Passenger Station Systems shall provide telephone access into the OCC Announcement Control System, which shall allow remote announcements to various Passenger Station PA Systems or groups of Passenger Station Systems via a secure access pass-code." The existing PA/ESS system does NOT support this functionality.

**Is the intent to add this feature to the existing functionality of the existing Arinc PA/VMS? This can be added but at a significant additional cost.**

**Response 48)** There is no intent to add new features or functionality to the existing PA/VMS system as part of this project. The specified remote dial-in functionality shall be omitted from the Bidders' scope of work insofar as it is not currently supported by the MBTA's PA/VMS system as of the final Bid submission deadline for this project.

**CHELSEA**  
**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question 49)** The CCTV Section specifies “Three(3) Two-Post Equipment Racks shall be installed in each of the four Communications Equipment Enclosures as depicted in the Contract Drawings”, and the drawings support that. The PA/ESS Section specifies “Furnish and install Public Address equipment case with a thermostatically controlled and vent fan. Power to the heater and vent fan to be provided on separate circuits from the power distribution panel.

**Is a 2-Post open frame rack the correct item to be furnished for the Public Address equipment?**

**Response 49)** The PA/ESS equipment shall be installed in two-post equipment racks within the communications equipment enclosures located at each of the four stations. These communications enclosures shall be climate-controlled. Therefore, PA/ESS equipment shall not require separate climate-controlled enclosures. The PA/ESS equipment shall be rack-mountable to the extent possible to minimize the use of wall-mounted components.

**Questions from McCourt Construction Dated 09/09/2014 @ 2:55 PM:**

**Question 50)** Reference plan sheet 85 (Drainage and Utility Plan - Washington Ave). The proposed NStar manholes are noted as being by others however, on page A00808-5 of the specifications, under Task 2 in the column titled Access Restraint (AR) & Limitations of Operations Notes, the manholes are noted as “MassDOT contractor performing the work”. Is furnishing and installing the NStar manholes included in the scope of this contract?

**Response 50)** The NSTAR Manholes will be furnished and installed by NSTAR. The Project Utility Coordination (PUC) form has been revised via this addendum.

**Question 51)** Reference plan sheet 85 (Drainage and Utility Plan - Washington Ave). The proposed Comcast manhole is noted as being by others however, on page A00808-5 of the specifications, under Task 4 there are no notes about who is performing the work. The construction of the duct banks is apparently part of this contract while pulling and splicing of new cables is apparently not. Is furnishing and installing the Comcast manhole included in the scope of this contract?

**Response 51)** The Comcast manholes will be furnished and installed by Comcast as part of their force account.

**CHELSEA**  
**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question 52)** Reference plan sheet 85 (Drainage and Utility Plan - Washington Ave. The plans show Verizon ductbanks on both sides of the bridge. Page A00808-5 (Page 5 of the PUC Form), Under Task 3 - Verizon, it appears that the Verizon work will be performed by Verizon subcontractors. Please confirm that the temporary support for the existing ductbanks and the installation of the proposed 4" split galvanized steel conduit installation will be by others.

**Response 52)** Verizon will be installing all of their infrastructure including manholes, conduit and cable as part of their force account.

**Question 53)** Reference Question 3; If the installation of the 4" split galvanized steel conduit will be performed by others, then where is item 806.41 4 Inch Electrical Conduit Type RM – Split galvanized Steel used?

**Response 53)** Item 806.41 – 4 INCH ELECTRICAL CONDUIT TYPE RM - SPLIT GALVANIZED STEEL is intended to be used on the east and west side of the bridge for the existing Verizon utility lines, it is correctly called out on the plans to be installed by others but was incorrectly carried in the estimate. This work will be performed by Verizon as part of their force account.

**Question 54)** Reference Question 3; If the installation of the 4" split galvanized steel will be done by the Contractor, please define the limits of work for 4" split galvanized steel conduits.

**Response 54)** The quantity for Item 806.41 has been reduced to 10 Feet via this Addendum and is to be used on a contingency basis only.

**Question from Mass Bay Electric Corp. Dated 09/10/2014 @ 8:59 AM:**

**Question 55)** On sheet number 107 the luminaire schedule shows a luminaire type RL-1. Where is this type of luminaire located in the plans?

**Response 55)** The Type RL-1 luminaire is installed in the proposed Bike Shelter as shown on Sheet Number 207.

**CHELSEA**  
**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question from SPS New England, Inc. Dated 09/10/2014 @ 10:11 AM:**

**Question 56)** It appears MBTA, Keolis Commuter services, and Pan Am Railroad can be covered under a single policy. Can you confirm that CSX needs their own separate policy?

**Response 56)** CSX can be a named insured on the Railroad Protection Liability Insurance Policy just as can the MBTA and other applicable railroads. They do not need their own separate policy.

**Questions from A.A. Will Corporation Dated 09/10/2014 @ 10:29 AM:**

**Question 57)** What is Item 903 for? The Detail Sheet description only states “various concrete work associated with the Washington Ave Bridge.” It’s not clear from the drawings where this is needed.

**Response 57)** Item 903 - 3000 PSI, 1.5 IN., 470 Cement Concrete is for use as part of the Washington Avenue reconstruction including for water main thrust blocks and utility trench encasement as directed.

**Question 58)** There is no Section 02300 Earthwork included in Appendix A MBTA Construction Specifications. How are excavation and backfill paid relative to the BRT Station work? Will Items 120-170 be used or is it incidental to the lump sum items? If it is incidental to the lump sum work, where is the line drawn between that limit of earthwork versus the busway earthwork??

**Response 58)** Excavation and backfill for the BRT Stations will be performed to the relevant provisions of the MassDOT Standard Specifications for Highways and Bridges, and will be measured and paid for under the contract items 120 – 170.

**Question 59)** Newly-added Specification Section 02195 states “Aggregate Pier soil reinforcement is required below various structures for this project as noted on the foundation plan sheets.” There are no notes on any of the foundation plan sheets mentioning this work. Which structures is this required for?

**Response 59)** The Ground Improvement – Aggregate Piers work is for the cast in place concrete upright foundations for the canopy structures at 3 of the BRT Stations. Refer to the revised Specification Section 02195 included with this Addendum No. 4.

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question 60)** Please provide a design for the Aggregate Pier soil reinforcement.

**Response 60)** Design of the Aggregate Pier Ground Improvement is a performance based system to be designed and constructed by a specialty contractor. Refer to the revised Specification Section 02195 included with this Addendum No. 4.

**Question 61)** Newly-added Specification Section 02195, Section 1.3A, states that “The Aggregate Pier Installer shall be approved by the Owner’s Engineer prior to bid opening.” How are prime bidders going to accomplish this?

**Response 61)** Specification Section 02195 has been revised as part of this Addendum No. 4. Revisions include changing the statement from “prior to bid opening” to “prior to construction”.

**Question 62)** Newly-added Specification Section 02195, Section 1.3B, states that “no alternate installer will be accepted unless approved by the Owner’s Engineer at least two (2) weeks prior to bid opening.” Is this requirement waived considering the specification was added only one week prior to bid opening? If not, can the Owner provide a list of approved installers?

**Response 62)** Specification Section 02195 has been revised as part of this Addendum No. 4. Revisions include changing the statement from “no alternate installer will be accepted unless approved by the Owner’s Engineer at least two (2) weeks prior to bid opening” to “no alternate installer will be accepted unless approved by the Engineer”.

**Question 63)** Considering a specification section (02195) for a significant construction operation was added only one week before bid opening, and this specification requires design and research into potential installers, will DOT consider a bid postponement?

**Response 63)** As indicated in the responses to the above questions, Specification Section 02195 has been revised, and no bid postponement is being considered.



**CHELSEA**  
**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Questions from The Barletta Companies Dated 09/10/2014 @ 1:32 PM:**

**Question 64)** Utility drawing sheet 71,72,75,77 highlights an object and states “New Pole Location (foundation by contractor, pole by others)”. Please provide a detail for these 5 foundations and confirm they are the responsibility of this contract.

**Response 64)** The foundations as well as the poles will be constructed by NSTAR under a separate contract allowance payment item. Contractor shall be responsible for coordinating his work with that of NSTAR.

**Question 65)** Wall 3 – it appears the profile of the existing grade on sheets 316 and 317 do not match the existing profile given on the Wall 3 drawings sheet 190 & 191 and wall 3 detail sheet 193. Please clarify the existing grade and proposed finish grades for wall 3. This is necessary to determine the SF of lagging panel.

**Response 65)** The existing grades on both the wall plans and the cross sections were derived from topographic survey. Minor adjustments in the field to match actual conditions may be made as directed by the Engineer. The detail on sheet 193 is typical for the walls and not for a specific location.

**Question 66)** The note at the bottom of drawing sheet No. 191 indicates the bottom of pile for wall No. 3 is at El. -16 but it appears to be drawn to El. -10. Please advise which is correct.

**Response 66)** The plan is drawn correctly. The bottom of pile elevation in this area is -10.0 (the Bottom of Pile El. of -16.0 is incorrect). Please see revised Plan Sheet 191 of 346 issued via this addendum.

**Question 67)** Addendum 3 provided Specification Section 02195 Ground Improvements Page A-00803-7.9 para. 1.1 states “ The work shall consist of designing, furnishing, and installing aggregate pier ground improvement to the lines and grades designated on the project foundation plan and as specified herein”. Please provide the sheet numbers for these foundation plans and/or advise which structures this work is required for.

**Response 67)** Specification Section 02195 and drawing Sheet 212 have been revised as part of this Addendum No. 4.

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question 68)** Please provide detail of the outlet control structure to be relocated shown on plans 83 and 84 & advise where this work gets paid.

**Response 68)** The outlet control structure may be constructed of precast concrete, cast-in-place concrete or remove and reset the existing structure. Contractor may assume structure similar to a typical catch basin or manhole with a grated inlet and a 12" outlet pipe.

**Question 69)** When will the new 8 ft. diameter structure and drain be constructed by others (Shown on drawing 73)?

**Response 69)** The contract to construct work along Spruce Street, including this 8 foot diameter drainage structure, is underway and is anticipated to be complete by Spring 2015.

**Question 70)** What size pipe will be required from DMH 10 to existing 8 ft CB shown on drawing sheet 73?

**Response 70)** 12" RCP.

**Question 71)** Refer to item 476.68 – "Joints" in Cement Concrete Paving Section in the 1988 Mass DOT Standard Specifications. Which types of joints are required for Item 476 for this project, and at what spacing?

**Response 71)** The paving shall include both longitudinal and transverse joints. It is assumed the Contractor will install a longitudinal joint along the centerline of the busway creating two 15' wide slabs and transvers joints will be 15' to 20 spacing. Refer to the Special Provision for Item 476. for additional information including dowel spacing.

**Question 72)** Section 120 – Earth Excavation includes removal, testing, and disposal of an abandoned gas line, potentially containing pcb's. Will the disposal of the abandoned gas lines containing pcb's be paid under Item 120 per CY or under 181.14 per TON?

**Response 72)** Removal is covered under Item 120. Disposal would be covered under Item 181.14.

**CHELSEA**  
**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question 73)** Please provide the limits of work for removal and disposal of the abandoned gas lines, as they do not appear to be shown on the drawings.

**Response 73)** Exact locations of abandoned gas lines is not known. If encountered, removal will be paid for under Item 120 and disposal paid for under Item 181.14

**Question 74)** In response to Addendum 3 Question 11 from Barletta Companies dated 9/03/2014 @ 1:25 PM – The response answered only the scenario if the material is unsuitable for re-use. If the material obtained in excavation is suitable for re-use, please confirm it will be paid for as Item 150.1 – Special Borrow, and no payment will be made for the excavation of such material per 1988 Standard Specifications page Section 120.81 page 64 No. 1.

**Response 74)** Yes, material obtained from excavation that is suitable for reuse as backfill under pavements and behind retaining walls, and meeting the gradation requirements for Special Borrow, will be paid for under Item 150.1.

**Question 75)** In response to Addendum 3 Question 11 from Barletta Companies dated 9/03/2014 @ 1:25 PM – For the excavated soils to be considered suitable for reuse, will the soils be required to meet criteria for Special Borrow?

**Response 75)** Yes, for materials to be used as backfill under roadways and behind retaining walls.

**Question 76)** In response to Addendum 3 Question 12 from Barletta Companies dated 9/03/2014 @ 1:25 PM – The response says payment for the removal of ties shall be included in “Item 184.1 – Removal of Treated Wood Products”. The Bid form lists Item 184.1 as “Disposal of Treated Wood Products” and the Special Provisions read, “This item includes all costs for permitting, sampling, laboratory testing, loading, transportation, and disposal...”. Please clarify if the removal of treated wood products is to be paid in Item 184.1 with the disposal by the TON, or paid in Item 120 by the CY in addition to the disposal in item 184.1 by the TON?

**Response 76)** Removal of treated wood products is included in Item 184.1.

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question 77)** Refer to typical sections (Sheets 6-13). Please confirm the F-Shape Asymmetrical Concrete Barrier detail is required only from STA 25+20 TO STA 29+80 as shown on sheet 6 (top section), and not elsewhere, as it is not shown as asymmetrical on any other typical section. (See sheet 280 for example, showing grade difference along barrier outside this stationing)

**Response 77)** The F-Shape Asymmetrical Concrete Barrier is only required from Sta. 25+20 to Sta. 30+39 as shown on sheet 25.

**Question 78)** Please supply detail for special manhole Item 203

**Response 78)** The special manhole can conform to the MassDOT Construction Standard Details, Drawing No. E 202.4.0.

**Question from SPS New England, Inc. Dated 09/10/2014 @ 4:37 PM:**

**Question 79)** Are there drawings and/or details available for section 02195 – Ground Improvement - Aggregate Piers added in Addendum 3?

**Response 79)** Design of the Aggregate Pier Ground Improvement is a performance based system to be designed and constructed by a specialty contractor. Refer to the revised Specification Section 02195 included with this Addendum No. 4 and notes added to Sheet 212.

**Questions from P. Gioioso & Sons, Inc. Dated 09/11/2014 @ 10:13 AM:**

**Question 80)** For the Retaining Wall Items 996.01 to 996.04, the 48” and 96” Chain Link Fence items are listed both on the Lump Sum Breakdowns and on the Quantity Detail Sheets for Pay Items 644.148 and 644.196. Please confirm that this fencing will be paid under the fencing pay items, and NOT as part of the Lump Sum wall items.

**Response 80)** The 48” and 96” Chain Link Fence Items are included in the Contract Lump Sum Costs for Items 996.01 thru 996.04 as indicated in the Special Provisions.

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Question 81)** For Retaining Wall #1, is it the intent of the contract to install the 3'-6" Safety Rail (as detailed on Sheet 195) for the entire length of Wall #1? Please provide a detail for mounting the safety rail adjacent to the 96" CL Fence, including stagger between the respective posts, or connection between the two systems if any.

**Response 81)** The 3'-6" Safety Rail is intended to be installed for the entire length of Retaining Wall #1. Mounting details will be developed with the Contractor during shop drawing review phase.

**Question 82)** Under what pay item will the signal work on Sheet 156 (Arlington St at 6th St) be paid? The reply to question #27 stated that this work is in Item 490.01, however this is the Grade Crossing at Spruce St. Should Spruce St signals be Item 490.01 and Arlington St signals be Item 815.3?

**Response 82)** All of the railroad track and signal work indicated on the drawings (Sheets 153 to 169) is included in the Contract Lump Sum Price for Item 490.01 – Railroad Grade Crossing Reconstruction. Items 815.1 thru 815.4 are for work associated with Traffic Signals at the respective intersections.

**Question 83)** Special Provisions and Sheet 133 both state that Item 815.3 covers the signals at Spruce St., which is in conflict with Item 490.01. Should Arlington St signals be Item 815.3 ?

**Response 83)** Sheet 133 and the Special Provisions for Items 815.1 thru 815.4 refer to the Traffic Signal Systems along the Busway. Item 490.01 is for the Railroad Signal work.

**Question from P. Gioioso & Sons, Inc. Dated 09/11/2014 @ 12:37 PM:**

**Question 84)** Regarding 810.11, the detail on revised sheet 15 appears to indicate an existing sleeve surrounding the BellCanada ducts. Please confirm if this is the case, and what is the casing material?

**Response 84)** There is no sleeve around the Bell Canada ducts. The detail on sheet 15 has been revised as part of this Addendum No. 4 to clarify.

**CHELSEA**  
**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue**

**Questions from A.A. Will Corporation Dated 09/11/2014 @ 12:59 PM:**

**Question 85)** Please provide details for the detention area shown on Sheet No. 84 of contract plans.

**Response 85)** The detention area will be graded and laid out as shown on the Grading & Curb Tie Plans, sheets 66 & 67, and planted as shown on the Landscape Plans, sheets 182 & 183.

**Question 86)** There is no special provision for Item 476 Cement Concrete Pavement. Please provide information, or a detail, indicating reinforcement, finish, and if there is any special joint condition where the slab meets the full depth asphalt busway.

**Response 86)** Item 476 Cement Concrete Pavement shall conform to the provisions of Section 476 of the MassDOT Standard Specifications for Highways and Bridges. To clarify special joint conditions, a Special Provision for this item has been provided and included with this Addendum. Please see Document A00801-120 attached.

**Question from Harris Re-bar, Inc. Dated 09/11/2014 @ 1:00 PM:**

**Question 87)** Under which bid item will the reinforcement for the low retaining walls (detail shown in Addendum #3, sheet 15) be placed under?

**Response 87)** The steel reinforcement will be incidental to the cost of the low retaining walls and included in the Contract Unit Price for Item 901.

**ADDENDUM NO. 4, SEPTEMBER 12, 2014****① ADDENDUM NO. 1, AUGUST 29, 2014****TABLE OF CONTENTS**

DOCUMENT 00010	
TABLE OF CONTENTS .....	00010-1 through 2
DOCUMENT 00102	
NOTICE TO CONTRACTORS .....	00102- 1 through 4
DOCUMENT 00210	
REQUIREMENTS OF MASSACHUSETTS GENERAL LAW CHAPTER 30, SECTION 39R .....	00210-1 through 4
DOCUMENT 00331	
LOCUS MAP .....	00331-1 through 2
DOCUMENT 00439	
CONTRACTOR PROJECT EVALUATION FORM .....	00439-1 through 2
DOCUMENT 00440	
SUBCONTRACTOR PROJECT EVALUATION FORM .....	00440-1 through 2
DOCUMENT 00710	
GENERAL CONTRACT PROVISIONS .....	00710-1 through 2
① DOCUMENT 00715	
INTERIM SUPPLEMENTAL SPECIFICATIONS .....	00715-1 through 18
DOCUMENT 00717	
SUPERPAVE REQUIREMENTS .....	00717-1 through 78
DOCUMENT 00718	
SPECIAL PROVISION FOR PARTICIPATION BY MINORITY OR WOMEN'S BUSINESS ENTERPRISES AND SERVICE- DISABLED VETERAN- OWNED BUSINESS ENTERPRISES .....	00718-1 through 10
DOCUMENT 00761	
SPECIAL PROVISIONS FOR CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION .....	00761-1 through 4
DOCUMENT 00811	
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES .....	00811-1 through 2
DOCUMENT 00812	
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE .....	00812-1 through 2
DOCUMENT 00813	
PRICE ADJUSTMENT FOR STRUCTURAL STEEL AND REINFORCING STEEL .....	00813-1 through 2
DOCUMENT 00814	
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES .....	00814-1 through 2
DOCUMENT 00820	
THE COMMONWEALTH OF MASSACHUSETTS SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM .....	00820-1 through 6
DOCUMENT 00821	
ELECTRONIC REPORTING REQUIREMENTS CIVIL RIGHTS PROGRAM AND CERTIFIED PAYROLL .....	00821-1 through 2
DOCUMENT 00859	
CONTRACTOR/SUBCONTRACTOR CERTIFICATION FORM .....	00859-1 through 2

**④ADDENDUM NO. 4, SEPTEMBER 12, 2014****②ADDENDUM NO. 2, SEPTEMBER 3, 2014**

DOCUMENT 00860	
COMMONWEALTH OF MASSACHUSETTS PUBLIC EMPLOYMENT LAWS .....	00860-1 through 2
DOCUMENT 00861	
STATE WAGE RATES .....	00861-1 through 40
DOCUMENT A00801	
SPECIAL PROVISIONS .....	A00801-1 through 256
DOCUMENT A00802	
DETAIL SHEETS .....	A00802-1 through 20
DOCUMENT A00803	
APPENDIX A – MBTA CONSTRUCTION SPECIFICATIONS FOR BUS RAPID TRANSIT STATION CONSTRUCTION .....	A00803-1 through 346
DOCUMENT A00804	
APPENDIX B – MBTA CONSTRUCTION SPECIFICATIONS FOR RAILROAD GRADE CROSSING RECONSTRUCTION WORK .....	A00804-1 through 152
DOCUMENT A00805	
APPENDIX C – GEO-TECH REPORT AND BORING LOGS .....	A00805-1 through 454
DOCUMENT A00806	
MBTA RAILROAD SPECIFICATIONS .....	A00806-1 through 190
DOCUMENT A00808	
PROJECT UTILITY COORDINATION FORM .....	A00808-1 through 8
<b>④ DOCUMENT A00810</b>	
<b>LICENSED SITE PROFESSIONAL (LSP) OPINIONS ON PROPERTIES SUBJECT TO ACTIVITY AND USE LIMITATIONS (AUL) .....</b>	<b>A00810-1 through 16</b>
DOCUMENT A00820	
REQUEST FOR RELEASE OF MASSDOT AUTOCAD FILES FORM.....	A00820-1 through 2
DOCUMENT A00830	
ARMY CORP OF ENGINEERS GENERAL PERMIT AND APPLICATION.....	A00830-1 through 214
DOCUMENT A00832	
DEPARTMENT OF ENVIRONMENTAL PROTECTION WATER QUALITY CERTIFICATE – APPENDIX D .....	A00832-1 through 24
DOCUMENT A00840	
NEGATIVE DETERMINATION OF APPLICABILITY AND REQUEST FOR DETERMINATION OF APPLICABILITY - CITY OF CHELSEA .....	A00840-1 through 52
<b>② DOCUMENT B00420</b>	
<b>PROPOSAL.....</b>	<b>B00420-1 through 28</b>
<b>④ DOCUMENT B00841</b>	
<b>MBTA SUB-CONTRACTOR APPROVAL REQUEST FORM.....</b>	<b>B00841-1 through 4</b>
DOCUMENT B00842	
SCHEDULE OF PARTICIPATION BY MINORITY OR WOMEN BUSINESS ENTERPRISE (M/WBE) .....	B00842-1 through 2
DOCUMENT B00843	
MINORITY OR WOMENS BUSINESS ENTERPRISE PARTICIPATION LETTER OF INTENT.....	B00843-1 through 2
DOCUMENT B00846	
M/WBE OR SDVOBE JOINT CHECK ARRANGEMENT APPROVAL FORM .....	B00846-1 through 2
DOCUMENT B00847	
JOINT VENTURE AFFIDAVIT .....	B00847-1 through 4

\*\*\* END TABLE OF CONTENTS \*\*\*



④ **ADDENDUM NO. 4, SEPTEMBER 12, 2014**

③ **ADDENDUM NO. 3, SEPTEMBER 9, 2014**

① **ADDENDUM NO. 1, AUGUST 29, 2014**

DOCUMENT 00102



### **NOTICE TO CONTRACTORS**

Electronic proposals for the following project will be received through the internet using Bid Express until the date and time stated below and. will be posted on [www.bidx.com](http://www.bidx.com) forthwith after the bid submission deadline. No paper copies of bids will be accepted. Bidders must have a valid digital ID issued by MassDOT in order to bid on projects. Bidders need to apply for a Digital ID at least 14 days prior to a scheduled bid opening date with Bid Express.

**TUESDAY, SEPTEMBER 16, 2014 at 2:00 P.M.**

**CHELSEA**

**Construction of the Silverline Gateway Busway,  
BRT Stations and Bridge Replacement (Steel) Br. No. C-09-001  
Washington Avenue over the MBTA Railroad  
(604428)**

PROJECT VALUE = \$38,260,000.00

- ④③① **All Bidders must be Prequalified By MASSDOT in HIGHWAY CONSTRUCTION for the full value of the Contract and by the MBTA FOR CLASS 1 - GENERAL TRANSIT CONSTRUCTION.**
- ④ **Contractors or Sub-Contractors doing work on MBTA Track, Signal and Power Systems must be skilled and experienced in these types of work and must be accepted as a Subcontractor by the MBTA through the use of Document B00841 - the MBTA SUBCONTRACTOR APPROVAL FORM which is issued via this addendum.**

An award will not be made to a Contractor who is not pre-qualified by the Department prior to the opening of Proposals.

Contractors intending to bid on this project must first complete a "Request for Proposal Form"(R-109 Form) and e-mail an electronic copy of this document to the MassDOT Director of Prequalification for approval. Please e-mail these documents to [prequal.r109@state.ma.us](mailto:prequal.r109@state.ma.us) .

Blank "Request for Proposal Forms"(R-109 Forms) can be obtained at  
<http://www.massdot.state.ma.us/highway/Departments/PrequalificationofHorizontalConstructionForms.aspx>

Select the link "Request for Official Proposal Form (R-109 Form)"

**④ADDENDUM NO. 4, SEPTEMBER 12, 2014**  
**ADDENDUM NO. 1, AUGUST 29, 2014**

**NOTICE TO CONTRACTORS** (Continued)

Upon approval, the official bidder shall be entitled to receive an officially numbered Compact Disc (CD) containing the plans and specifications, free of charge. Other interested parties may also receive an informational copy of the CD containing the plans and specifications, free of charge. It should be noted that informational copies cannot be used for bidding purposes. The bidding for and award of the contract for this project is to be in accordance with the requirements of Massachusetts General Laws Chapter 30 § 39M.

All parties who wish to have the CDs shipped to them must provide a completed mailing label with an approved carrier account number for overnight mail service (i.e. – Federal Express) to the MassDOT Bid Document Distribution Center, Room 6261, 10 Park Plaza, Boston, MA 02116.

A Proposal Guaranty in the amount of 5% of the value of the bid is required either using BidX's online form or by separately submitting an electronic copy of the Proposal Guaranty via e-mail to [MassDOTBidBonds@dot.state.ma.us](mailto:MassDOTBidBonds@dot.state.ma.us).

Bidders are on notice that this project is subject to the schedule of prevailing wage rates as determined by the Commissioner of the Massachusetts Department of Labor and Workforce Development, Division of Occupational Safety.

Plans will be on display and information will be available at the MassDOT Boston Office and at the District Office in BOSTON.

- ④ This Contract contains price adjustments for hot mix asphalt and Portland cement mixtures, diesel fuel, and gasoline. For this project the base prices are as follows: liquid asphalt \$640.00 per ton, Portland cement \$123.78 per ton, diesel fuel \$3.288 per gallon, and gasoline \$3.056 per gallon. MassDOT posts the **Price Adjustments** on their Highway Division's website at <http://www.massdot.state.ma.us/Highway/> under the following link sequences:

Doing Business With Us  
Construction  
Price Adjustments

**STEEL PRICE ADJUSTMENT**

This Contract contains Price Adjustments for steel. See Document 00813 - PRICE ADJUSTMENT FOR STRUCTURAL STEEL AND REINFORCING STEEL of the Special Provisions for their application.

The Base Prices for these items on this project are as follows:

**Rebar**

- ④ ASTM A615/A615M Grade 60 (AASHTO M31 Grade 420) Reinforcing Steel = \$0.38 per pound

**④ADDENDUM NO. 4, SEPTEMBER 12, 2014****④****PROCEDURE FOR RELEASING AUTOCAD FILES TO THE GENERAL CONTRACTOR**

After the bid opening the low bidder may submit the Request for Release of MassDOT AutoCAD Files Form to the Highway Design Engineer. When the Highway Design Section has received both the AutoCAD files from the designer and the Request for Release of MassDOT AutoCAD Files Form from the Contractor, Highway Design will email the contractor a link through Dropbox.com with a reminder disclaimer of use (copy to Project Manager and District Construction Engineer).

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## **CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS**

Prospective bidders are required to submit all questions to the Construction Contracts Engineer by 1:00 P.M. on the Thursday before the scheduled bid opening date. Any questions received after this time will not be considered for review by the Department.

Contractors should email questions and addendum acknowledgements to the following email address [massdot-specifications@dot.state.ma.us](mailto:massdot-specifications@dot.state.ma.us). Please put the MassDOT project file number and municipality in the subject line.

## **ENGINEERING DIRECTIVES**

Contractors can access MassDOT, Highway Division Engineering Directives at:

<http://www.mass.gov/massdot/highway>

Select Doing business with us

Select Design/Engineering

Select Engineering & Policy Directives

Select Engineering Directives

## **CONTRACTOR/SUBCONTRACTOR CERTIFICATION – CONTRACT COMPLIANCE**

(Revision 03-23-10)

Pursuant to 23 C.F.R. § 633.101 et seq., the Federal Highway Administration requires each contractor to “insert in each subcontract, except as excluded by law or regulation, the required contract provisions contained in Form FHWA–1273 and further requires their inclusion in any lower tier subcontract that may in turn be made. The required contract provisions of Form FHWA–1273 shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the requirements contained in the provisions of Form FHWA–1273.” The prime contractor shall therefore comply with the reporting and certification requirements provided in MassDOT’s CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form (DOT-DIST-192) certifying compliance with 23 C.F.R. § 633.101 for each subcontract agreement entered into by the contractor. The contractor shall provide a fully executed original copy of said CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form to MassDOT upon execution of any subcontract agreement. Failure to comply with the reporting and certification requirement of the CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form may result in action against the prequalification status of the prime contractor with MassDOT.

## **SUBSECTION 4.04 CHANGED CONDITIONS**

This Subsection is revised by deleting the two sequential paragraphs near the end that begin “The Contractor shall be estopped...” and “Any unit item price determined ...” (1/6/2006)

**③ADDENDUM NO. 3, SEPTEMBER 9, 2014****CONTRACTUAL MILESTONES** (Supplementing Subsection 8.03)

This Contract contains the following Contractual Milestones that are to be included in the Contractor's Baseline Contract Progress Schedule submission. The Contractor shall identify the completion of the work pertaining to each Contractual Milestone through the inclusion of a Finish Milestone in the Baseline Contract Progress Schedule.

To ensure that the Contractor performs the Project on schedule, MassDOT has established the following three (3) milestones defined as follows: **Contractual Milestones:**

- ③ **Milestone #03 – Washington Avenue Bridge - One lane open in Northbound direction:** The Contractor shall achieve Completion within **449 Calendar Days from the date the Washington Avenue Bridge is closed to traffic.** Contractor Completion for Milestone #03 is defined as the completion of all physical contract work required so that Washington Avenue may be opened to one-way traffic in the Northbound direction.

**Milestone #02 – Full Beneficial Use & Substantial Completion of the Washington Avenue Bridge and Full Operation of the Busway:** The Contractor shall achieve Full Beneficial Use & Substantial Completion within **700 Calendar Days from Notice to Proceed.** Contractor completion for Milestone #02 is defined as the complete demolition of the existing bridge structure, completion of the roadway approach work, and full completion of the new Bridge open to two-way traffic with both sidewalks open to pedestrians; full operation of the busway including fully operational Bus Rapid Transit Stations and shared use path further defined as follows:

**Full Beneficial Use:** The majority of Contract Work has been completed and the asset(s) has been opened for full multi-modal transportation use, except for limited contract work items that do not materially impair or hinder the intended public use of the transportation facility. All anticipated lane takings have been completed and removed, except for minor, short term work items.

**Substantial Completion:** A walkthrough of the entire Contract Work has been performed by the Resident Engineer, a Punchlist has been generated and the Work required by the Contract, including paperwork, has been completed, except for work having a contract price of less than one percent of the adjusted total contract price, including overruns, underruns and all contract amendments. All material submittals have been received by the District Materials Lab.

**Milestone #01 – Contractor Field Completion:** The Contractor shall achieve Contractor Field Completion within **728 Calendar Days from Notice to Proceed.** Contractor completion for Milestone #01 is defined as completion of Milestones #03 and #02 and all punch list work.

**Contractor Field Completion:** All physical Contract Work is complete including punch list. The Contractor has fully de-mobilized from field operations.

**④ADDENDUM NO. 3, SEPTEMBER 9, 2014****③ADDENDUM NO. 3, SEPTEMBER 9, 2014****INCENTIVE/DISINCENTIVE REQUIREMENTS**

For the purposes of this Contract, MassDOT is instituting a No Excuse Incentive/Disincentive Clause for Milestone #03 and Milestone #02. There will be no incentive or disincentive associated with Milestone #01. This specification is intended to encourage the Contractor to use innovative methodologies to achieve early completion of key milestones. To encourage such innovation, keep daily road user costs (DRUC) at a minimum, and minimize disruption to adjacent neighborhoods and businesses, MassDOT is proposing the following incentive/disincentive provisions.

**Incentive/Disincentive for Milestone #03**

- ③ Incentive Payments: If the Contractor successfully achieves Milestone #03 as defined above before **449** Calendar Days from **the date the Washington Avenue Bridge is closed to traffic**, MassDOT shall pay an Incentive Payment of \$18,000.00 per Calendar Day. The Maximum Incentive Amount shall not exceed \$1,764,000.00 and 98 Calendar Days.
- ④ Disincentive Deduction: Conversely, if the Contractor achieves Milestone #03 later than **449** Calendar Days from **the date the Washington Avenue Bridge is closed to traffic**, MassDOT shall assess the Contractor a Disincentive Deduction of \$18,000.00 per Calendar Day. The maximum Disincentive amount shall not exceed \$1,764,000.00 and 98 Calendar Days.

**Incentive/Disincentive for Milestone #02**

Incentive Payments: If the Contractor successfully achieves Milestone #02 before **700** Calendar Days from Notice to Proceed, MassDOT shall pay an Incentive Payment of \$8,500.00 per Calendar Day. The maximum Incentive amount shall not exceed \$824,500 and 97 Calendar Days.

Disincentive Deduction: Conversely, if the Contractor achieves Milestone #02 later than **700** Calendar Days from the Notice to Proceed, MassDOT shall assess the Contractor a Disincentive Deduction of \$8,500.00 per Calendar Day. The maximum Disincentive amount shall not exceed \$824,500.00 and 97 Calendar Days.

**Time Extensions**

The Engineer shall determine time extensions in accordance with Subsection 8.10 of the Standard Specifications, Determination and Extension of Contract Time for Completion. There shall be no other basis for extension of time other than as provided in Subsection 8.10 of the Standard Specifications.

For purposes of determining whether the Contractor shall receive an Incentive Payment, the number of Calendar Days set forth in Milestone #03 and #02 will not be adjusted under any circumstances for any reason, cause, or circumstance whatsoever, regardless of fault, save for and except in the instance of a catastrophic event and/or declared state of emergency.

**④ADDENDUM NO. 4, SEPTEMBER 12, 2014****ITEM 180.3****PERSONNEL PROTECTION LEVEL 'C' UPGRADE****HOUR****GENERAL**

The Contractor shall provide to all workers disposable, protective clothing appropriate to the hazard level of the work. The protective equipment and its use shall be in strict compliance with the Health and Safety Plan (Item 180.1), and all appropriate regulations that address employee working conditions.

**BASIS OF PAYMENT**

Payment for this item will be at the contract unit price, per hour, per man, required in level 'C' personnel protection.

**ITEM 180.4****MONITORING/HANDLING AND STOCKPILING  
OF CONTAMINATED SOILS****CUBIC YARD**

The On-Site Safety Officer or Environmental Consultant shall be responsible for evaluating soil with non-natural discoloration, petroleum or chemical odor, the presence of petroleum liquid or sheening on the groundwater surface or any abnormal gas or materials in the ground which are known or suspected to be contaminated with oil or hazardous materials. Soil suspected of gasoline contamination shall be field tested using the jar headspace procedures according to Department of Environmental Protection Bureau of Waste Site Cleanup Interim Policy #WSC-94-400 (Remedial Waste Management Policy for Petroleum Contaminated Soil) and the Bureau of Waste Prevention Policy #COMM-97-001 (Reuse and Disposal of Contaminated Soil and Massachusetts Landfills). The Engineer shall be contacted immediately when any results indicate contamination requiring soil removal or when contamination not detectable by on-site instrumentation is suspected. The Contractor shall be required to supply all personnel and materials necessary to comply with this section and to support the anticipated levels of protection and monitoring described above.

Within limited areas of the project site, it is likely that excavated soils may be contaminated. Where possible, all soils originally in contact with groundwater will be replaced in the same trench up to the existing groundwater level. All soils determined to be contaminated by metals or petroleum products, through the monitoring/evaluation program will be stockpiled for disposal in accordance with all Massachusetts Department of Environmental Protection statutes, policies, and regulations.

The Environmental Consultant/Contractor shall be responsible for identifying a disposal/recycling facility and obtaining all permits, approvals, Bill of Lading, etc. prior to the removal of the contaminated soil from the site. Any soils contaminated with hazardous materials that are not of petroleum origin shall be handled on a case-by-case basis. The contractor shall obtain at least three bids for the handling and disposal of any contaminated material. All manifest, bills of lading, etc. will be the responsibility of the Contractor with copies provided to the Department. The Contractor is also responsible for hiring a Licensed Site Professional (LSP), as needed, for oversight and Bills of Lading, etc.

- ④ Construction activities will occur within portions of 3 properties (151 Everett Avenue, 63 Washington Street and 2 Griffin Way) that are subject to Activity & Use Limitations (AUL). Draft LSP Opinions per the Department of Environmental Protection Bureau of Waste Site Cleanup have been prepared and are include in an Appendix to these Contract Documents.

**ITEM 180.4** (Continued)**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Measurement shall be made by the volume, per CUBIC YARD, of contaminated material monitored, handled and/or stockpiled as described under Item 180.4.

Work under this Item shall be paid at the Contract bid price, per CUBIC YARD, which payment shall be considered compensation for all labor, tools, equipment and materials needed to do the work as described above.

**ITEM 180.5****LICENSED SITE PROFESSIONAL****HOUR**

A Licensed Site Professional (LSP) will be required to provide the services necessary to comply with the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.000, with respect to the scope of work for this Contract. These services will include, but are not limited to, sampling and analysis of potentially contaminated media, preparation of IRA, URAM and RAM Plans, status reports, transmittal forms, release notification forms, completion statements and related documents required pursuant to the MCP. The LSP will be responsible for obtaining all permits related to the characterization, treatment, and disposal of contaminated media. The LSP will provide oversight of handling, stockpiling, re-use, treatment and disposal of contaminated media, including preparation of Bills of Lading, Manifests, and related shipping documents. Environmental technicians, including but not limited to personnel conducting field monitoring and sampling, data interpretation and support services directly related to MCP compliance, are also included in this Item.

The name and qualifications of the Licensed Site Professional will be submitted to the Engineer for review and approval at least two weeks prior to initial site activities. The LSP shall have significant experience in the oversight of MCP activities at active construction sites.

The LSP will coordinate all activities with MassDOT and the Massachusetts Department of Environmental Protection through the Engineer or his/her designee.

The LSP will be responsible for adequately characterizing contaminated media to insure that it meets the requirements of the MCP and, in the case of contaminated media to be disposed of off-site, to insure that it meets the acceptance criteria set forth by the disposal facility. The LSP will be responsible for adequately characterizing subsurface conditions prior to backfill in areas where contaminated soil/sediments are excavated. The cost of laboratory analyses conducted in accordance with the sampling and assessment requirements for compliance with the MCP will be paid for within the unit bid price for Item 180.4 – Monitoring/ Handling and Stockpiling of Contaminated Soils, Item 180.6 – Soil Tests, and Item 181.11 Disposal Of Unregulated Soil, Item 181.12 Disposal Of Regulated Soil - In-State Facility, Item 181.13 Disposal Of Regulated Soil Out-Of-State Facility and Item 181.14 Disposal Of Hazardous Waste.

**BASIS OF PAYMENT**

Work under this Item shall be paid at the Contract price per HOUR of service provided to perform the work as described above. The bid price shall reflect the cost of the LSP and any environmental technicians providing the services described above.



**ITEM 472.01** (Continued)

The work shall be performed in the following general manner:

- Using manufacturer prescribed methods and equipment, the Contractor shall adequately heat and uniformly mix the IMPRINT material(s) together.
- Color and pattern shall be as shown on the plans.
- The Contractor shall then apply the mixed IMPRINT material to the surface of a hardened, structurally sound bituminous concrete or cement concrete pavement, as directed.
- The IMPRINT material shall be spread to the desired build thickness using specialized ironing tools, heated sufficiently to smooth the surface to a state of readiness for texturizing.
- The color, texture and surface pattern shall be in accordance with the details shown on the plans.
- Once the finished surface has cooled sufficiently, the application area may be opened to vehicular and/or pedestrian traffic.
- Any residue resulting from this work shall be removed and disposed of in a proper manner. The completed work area is to be left in a neat and clean condition, satisfactory to the City and the Engineer.
- The Contractor will provide police protection when necessary. The Contractor will be responsible for furnishing and placing a sufficient number of safety cones to adequately protect all work zones, and to insure the orderly flow of vehicular and pedestrian traffic.
- Special care must be exercised by the Contractor during the operation of work to save from harm and injury, any structure, public or private, situated above or below the surface and lying within the scope of the project. If during the execution of the work, the contractor, through willfulness or carelessness, permits or causes any damage, the cost of satisfactory repair or replacement shall be the financial responsibility of the Contractor.

**METHOD OF MEASUREMENT**

ITEM 472.01, IMPRINT CROSSWALKS shall be measured for payment per SQUARE FOOT, complete in place.

**BASIS OF PAYMENT**

ITEM 472.01, IMPRINT CROSSWALKS shall be paid for at the respective contract unit price per SQUARE FOOT, which price shall include all labor, material, equipment, mobilization, mock-up, and incidental costs required to complete the work.

There will be no additional compensation for the disposal of excavated materials or excess Imprint materials. No deductions will be made for structures within the work area such as manholes, catch basins, or water covers.

**④ ADDENDUM NO. 4, SEPTEMBER 12, 2014****④      ITEM 476.                              CEMENT CONCRETE PAVEMENT                              SQUARE YARD**

The work under this Item shall conform to the relevant provisions of Section 476 of the Standard Specifications and the following:

The work shall include the furnishing and installing materials necessary to complete construction of the cement concrete pavements as indicated on the Contract Drawings.

Load transfer devices consisting of steel dowels conforming to the requirements of Subsection 476.40 shall be installed along all concrete construction and contraction joints. The dowels shall be sixteen inches (16") long, one inch (1") diameter, and spaced twelve inches (12") center to center. Dowels shall not be placed within 12" of the edge of concrete slab.

The dowels shall be located at a depth of  $D/2 \pm 1/4$ " from the concrete surface, where D is equivalent to the thickness of the slab. Joints and dowels shall be installed in accordance with Subsection 476.68.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

ITEM 476. CEMENT CONCRETE PAVEMENT will be measured and paid for at the Contract Unit Price per SQUARE YARD; which price shall be considered full payment for all labor, material and equipment necessary to construct cement concrete pavements. No separate payment shall be made for the sawcutting, joints, dowels, and all other incidentals to complete the work.

**ITEM 482.3                              SAWING ASPHALT PAVEMENT                              FOOT**

The work under this item shall include the saw-cutting of existing pavements which are to remain at limits of sidewalk construction, wheelchair ramp construction as shown on the plans and as directed by the Engineer. Saw cutting shall be full depth through the existing material.

Saw cutting equipment shall be approved by the Engineer prior to commencing work.

All edges of excavations made in existing pavements, driveways, and sidewalks which will not be overlaid and which will be visible shall be squared by saw-cutting with power-driven tools to provide a neat, clean edge for joining new pavement and sidewalks as shown on the Plans. Ragged, uneven edges shall not be accepted. Areas which have been broken or undetermined shall be edged neatly with a minimum disturbance to remaining pavement or sidewalks.

Saw-cut surfaces shall be sprayed or painted with a uniform thin coat of RS-1 asphalt emulsion immediately before placement of bituminous concrete material against the surface.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Sawing pavements and sidewalk joints will be measured for payment by the foot on the pavement surface complete in place.

Sawing pavements and sidewalk joints will be paid for at the contract unit price per FOOT, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for saw-cutting required for the installation of conduit, but all costs in connection therewith shall be included in the unit price bid for their respective items.

**SECTION 02195**

**GROUND IMPROVEMENT – AGGREGATE PIERS**

**PART 1 - GENERAL REQUIREMENTS**

**1.1 Description**

Aggregate Pier soil reinforcement is required below the cast in place concrete upright foundations for the canopy structures at the Mystic Mall, Downtown Chelsea and Eastern Avenue Bus Rapid Transit (BRT) Stations. Work shall consist of designing, furnishing and installing aggregate pier ground improvement to the lines and grades designated on the project foundation plan and as specified herein. The aggregate piers shall be in a columnar-type configuration and shall be used for support of foundation loads.

The aggregate pier ground improvement shall be designed and constructed by a specialty contractor as a performance based system in accordance with these specifications. The performance requirements are to limit settlement of each canopy structure footing to less than 1 inch and a differential settlement of less than ½ inch between each footing with the depth of ground improvement extending at least 2 times the width of the footing below the bottom of the footing.

**1.2 Work Included**

- A. Provision of all equipment, material, labor, and supervision to design and install aggregate piers. Design shall rely on subsurface information presented in the project geotechnical report. Layout of aggregate piers, spoil removal (as required), footing excavations, and subgrade preparation following aggregate pier installation is not included.
- B. The aggregate pier design and installation shall adhere to all methods and standards described in this Specification.
- C. Drawings and General Provisions of the Contract, including General and Supplemental Conditions, apply to the work in this specification.

**1.3 Approved Installers**

- A. The Aggregate Pier Installer (the Installer) shall be approved by the Engineer prior to construction. Prior to approval, Installers or their Designers are required to submit to the Engineer a qualification statement to demonstrate experience on at least 5 projects of a similar scope and nature. Additionally, prior to approval, Installers or their Designers are required to submit to the Engineer a preliminary design document and interview with the Engineer. Without exception, no alternate installer will be accepted unless approved by the Engineer.
- B. Installers of aggregate pier foundation systems shall have a minimum of 5 years of experience with the installation of aggregate pier systems and shall have completed at least 5 projects.

**1.4 Reference Standards**

- A. Design

## ADDENDUM NO. 4, SEPTEMBER 12, 2014

1. “Control of Settlement and Uplift of Structures Using Short Aggregate Piers,” by Evert C. Lawton (Assoc. Prof., Dept. of Civil Eng., Univ. of Utah), Nathaniel S. Fox (President, Geopier Foundation Co., Inc.), and Richard L. Handy (Distinguished Prof. Emeritus, Iowa State Univ., Dept. of Civil Eng.), reprinted from *IN-SITU DEEP SOIL IMPROVEMENT, Proceedings of sessions sponsored by the Geotechnical Engineering Division/ASCE in conjunction with the ASCE National Convention held October 9-13, 1994, Atlanta, Georgia*.
  2. “Settlement of Structures Supported on Marginal or Inadequate Soils Stiffened with Short Aggregate Piers,” by Evert C. Lawton and Nathaniel S. Fox. *Geotechnical Special Publication No. 40: Vertical and Horizontal Deformations of Foundations and Embankments*, ASCE, 2, 962-974.
  3. “Behavior of Geopier®-Supported Foundation Systems during Seismic Events,” by Kord Wissmann, Evert C. Lawton, and Tom Farrell. Geopier Foundation Company, Inc. Blacksburg, VA ©1999.
  4. “The design of vibro replacement.” H.J. Priebe. *Ground Engineering*, London. Dec 1995.
- B. Modulus Testing
1. ASTM D 1143 - Pile Load Test Procedures
  2. ASTM D 1194 - Spread Footing Load Test
- C. Materials and Inspection
1. ASTM D 1241 - Aggregate Quality
  2. ASTM D 422 - Gradation of Soils
- D. Where specifications and reference documents conflict, the Aggregate Pier Designer shall make the final determination of the applicable document.

### 1.5 Certifications and Submittals

- A. Design Calculations - The Installer shall submit detailed design calculations and construction drawings prepared by the Aggregate Pier Designer (the Designer) for review and approval. All plans shall be sealed by a Professional Engineer in the State in which the project is constructed.
- B. Professional Liability Insurance - The Aggregate Pier Designer shall have Errors and Omissions design insurance for the work. The insurance policy should provide a minimum coverage of \$3 million per occurrence.
- C. Building Code Acceptance – The Aggregate Pier Installer shall demonstrate that the Aggregate Pier system has been evaluated by the International Code Council (formerly ICBO).
- D. Modulus Test Reports – A modulus test(s) is performed on a non-production Aggregate Pier element as required by the Aggregate Pier Designer to verify the design assumptions. The Installer shall furnish the General Contractor a description of the installation equipment, installation records, complete test data, analysis of the test data and verification of the design parameter values based on the modulus test results. The report shall be prepared under direction of a Registered Professional Engineer.

- E. Daily Aggregate Pier Progress Reports – The Installer shall furnish a complete and accurate record of Aggregate Pier installation to the General Contractor. The record shall indicate the pier location, length, volume of aggregate used or number of lifts, densification forces during installation, and final elevations or depths of the base and top of piers. The record shall also indicate the type and size of the installation equipment used, and the type of aggregate used. The Installer shall immediately report any unusual conditions encountered during installation to the General Contractor, to the Designer and to the Testing Agency.

**1.6 Design Requirements for Aggregate Piers**

- A. The design of the Aggregate Pier system shall be based on the service load bearing pressure and the allowable total and differential settlement criteria of all footings indicated by the design team for support by the Aggregate Pier system. The Aggregate Pier system shall be designed in accordance with generally-accepted engineering practice and the methods described in Section 1 of these Specifications. The design life of the structure shall be 75 years.
- B. The design shall meet the foundation and slab loading criteria, and settlement performance criteria as shown on the foundation plans and notes.
- C. The Rammed Aggregate Pier elements shall be designed using a Rammed Aggregate Pier stiffness modulus to be verified by the results of the modulus test described in Section 5.02 of these specifications.

**1.7 Design Submittals**

The Installer shall submit detailed design calculations, construction drawings, and shop drawings, (the Design Submittal), for approval at least 6 week(s) prior to the beginning of construction of the aggregate piers. A detailed explanation of the design parameters for settlement calculations shall be included in the Design Submittal. Additionally, the quality control test program for Aggregate Pier system, meeting these design requirements, shall be submitted. All computer-generated calculations and drawings shall be prepared and sealed by a Professional Engineer, licensed in the State or Province where the piers are to be built. Submittals will be submitted electronically only unless otherwise required by specific submittal instructions.

- A. The following shall be included in the design calculation submittal:
  - 1. A written summary report that describes the overall ground improvement design.
  - 2. Applicable code requirements and design references.
  - 3. Ground improvement critical design cross-section(s) geometry including soil/rock strata and location, magnitude and direction external surcharge loads and piezometric levels with critical slip surface shown along with minimum calculated global stability factor of safety.
  - 4. Design criteria including, soil/rock shear strengths including friction angle and cohesion, unit weights, aggregate pier hole diameter, aggregate pier spacing, aggregate pier unit weight and friction angle, composite shear strength parameters and any other design assumptions.

## **ADDENDUM NO. 4, SEPTEMBER 12, 2014**

5. Design calculation sheets with project number, wall location, designation, date of preparation, initials of designer and checker, and page number at the top of each page. An index page with the design calculations shall be provided.
  6. Design notes including an explanation of any symbols and computer programs used in the design.
  7. Detailed subgrade preparation notes and requirements.
- B. Working Drawings. Utility locations, right of way and other applicable information is available on the plans. Working drawings shall include, but not be limited to the following items:
1. A plan view of the ground improvement for the identifying:
    - 1.1 Right of way, permanent or temporary construction easement limits, location of all known active or abandoned existing utilities, adjacent structures, or other potential interferences. Any drainage structure or drainage pipe centerline behind, passing through, or passing under the structure.
    - 1.2 Limits of the ground improvement and layout of the individual aggregate piers.
  2. Subsurface exploration locations shown on a plan view of the proposed structure alignment with appropriate reference base lines to fix the locations of the explorations relative to the structure.
  3. Elevation view showing aggregate pier locations, elevations and depth of improvement; location of drainage elements and expansion/contraction joints when applicable.
    - 3.1 Existing and finish grade profiles both behind and in front of the structure.

### **PART 2 - MATERIALS**

#### **2.1 Aggregate**

- A. Aggregate used by the Aggregate Pier Installer for pier construction shall be pre-approved by the Engineer and shall demonstrate suitable performance during modulus testing. Typical aggregate consists of Type 1 Grade B in accordance with ASTM D-1241-68, No. 57 stone, recycled concrete or other graded aggregate approved by the Designer.
- B. Potable water or other suitable source shall be used to increase aggregate moisture content where required. The Contractor shall provide such water to the Installer.

### **PART 3 - EXECUTION**

#### **3.1 Site Preparation and Protection**

- A. The Contractor shall locate and protect underground and aboveground utilities and other structures from damage during installation of the Aggregate Piers.

- B. Site grades for aggregate pier installation shall be within 1 foot of the top of footing elevation or finished grade elevation to minimize aggregate pier installation depths. Ground elevations and bottom of footing elevations shall be provided to the Rammed Aggregate Pier Installer in sufficient detail to estimate installation depth elevations to within 3 inches.

### **3.2 Excavations for Obstructions**

- A. Should any obstruction be encountered during Aggregate Pier installation, the General Contractor shall be responsible for promptly removing such obstruction, or the pier shall be relocated or abandoned. Obstructions include, but are not limited to, boulders, timbers, concrete, bricks, utility lines, etc., which shall prevent placing the piers to the required depth, or shall cause the pier to drift from the required location.
- B. Dense natural rock or weathered rock layers shall not be deemed obstructions, and piers may be terminated short of design lengths on such materials.

### **3.3 Approved Installation Procedures**

The following sections provide general criteria for the construction of the Aggregate Piers. Unless otherwise approved by the Engineer, the installation method used for Aggregate Pier construction shall be that as used in the construction of the successful modulus test.

- A. Aggregate Piers Installed using augered Rammed Aggregate Pier systems
  1. Augered Rammed Aggregate Pier systems shall be pre-augered using mechanical drilling or excavation equipment.
  2. If cave-ins occur during excavation such that the sidewalls of the hole are deemed to be unstable, steel casing shall be used to stabilize the cavity may be used.
  3. Aggregate shall be placed in the augered cavity in compacted lift thicknesses no greater than 24 inches as determined by the Aggregate Pier Designer.
  4. Should cave-ins occur on top of a lift of aggregate such that the volume of the caved soil is greater than 10 percent of the volume of the aggregate in the lift, then the aggregate shall be considered contaminated and shall be removed and replaced with uncontaminated aggregate.
  5. A specially-designed beveled tamper and high-energy impact densification apparatus shall be employed to densify lifts of aggregate during installation. The tamper diameter shall be at least 80% of the pre-augered hole diameter. The apparatus shall apply direct downward impact energy to each lift of aggregate.
  6. The Installer shall provide a full-time Quality Control technician on-site during the installation process.
- B. Aggregate Piers Installed using Vibroflot Stone Columns
  1. If vibroflot stone column construction is used to construct the Aggregate Piers, the Installer shall use an electric down-hole vibroflot (probe) capable of providing at least 200 HP of rated energy and a centrifugal force of 20 tons. The vibroflot diameter must be at least 60% of the Aggregate Pier design diameter. An appropriate metering device should be provided at such a location that inspection of amperage build-up may be verified during the operation of the equipment. Metering device may be an ammeter directly indicating the performance of the vibroflot tip of the eccentric. Complete

equipment specifications should be submitted to the Engineer prior to commencement of the fieldwork.

2. The probe and follower tubes shall be of sufficient length to reach the elevations shown on the installer's approved construction drawings. The probe, used in combination with the available pressure to the tip jet, shall be capable of penetration to the required tip elevation. Pre-augering shall be used to aid penetration.
3. The probe shall penetrate into the foundation soil layer to the minimum depths required in the installer's construction plans. After penetration to the required depth, the probe shall not be withdrawn more than 2 feet at any time unless the stone stops flowing to the bottom of the probe.
4. Redriving the probe into the treated depth shall be attempted at approximately 12 to 18-inch intervals to observe resistance to penetration and amperage build-up. During redriving, the probe tip shall penetrate to within 1 foot of the previous redriving depth.
5. Amperage build-up and backfill quantities will be contingent upon the type of probe used and procedures. Prior to commencement of work, the contractor shall discuss the equipment capabilities with the Engineer to determine if trial probes will be necessary.
6. The Installer shall provide a full-time quality control technician on-site during the installation process.

### **3.4 Footing Bottoms**

- A. Foundation excavations to expose the tops of Aggregate Piers shall be made in a workman-like manner, and shall be protected until concrete placement, with procedures and equipment best suited to (1) avoid exposure to water, (2) prevent softening of the matrix soil between and around the Aggregate Piers before pouring structural concrete, and (3) achieve direct and firm contact between the dense, undisturbed Aggregate Piers and the concrete footing.
- B. All excavations for footing bottoms supported by Aggregate Pier foundations shall be prepared in the following manner by the General Contractor. Recommended procedures for achieving these goals are to:
  1. Limit over-excavation below the bottom of the footing to 3-inches (including disturbance from the teeth of the excavation equipment).
  2. Compaction of surface soil and top of Aggregate Piers shall be prepared using a motorized impact compactor ("Wacker Packer," "Jumping Jack," or similar). Sled-type tamping devices shall only be used in granular soils and when approved by the designer. Loose or soft surficial soil over the entire footing bottom shall be recompacted or removed, respectively. The surface of the aggregate pier shall be recompacted prior to completing footing bottom preparation.
  3. Place footing concrete immediately after footing excavation is made and approved, preferably the same day as the excavation. Footing concrete must be placed on the same day if the footing is bearing on moisture-sensitive soils. If same day placement of footing concrete is not possible, open excavations shall be protected from surface water accumulation. A lean concrete mud-mat may be used to accomplish this. Other methods must be pre-approved by the Designer.
- C. Subgrade Preparation: Following aggregate pier installation, the General Contractor will prepare the subgrade prior to the placement of new engineered fill for earth embankments or



MSE retaining walls. The subgrade preparation and fill placement shall be performed in accordance with project specifications.

1. Compaction of surface soil and top of Aggregate Piers shall be prepared using a sled-type tamping device. Motorized impact compactors ("Wacker Packer," "Jumping Jack," or similar) shall only be used in cohesive soils and when approved by the designer. Loose or soft surficial soil over the entire footing bottom shall be recompact or removed, respectively. The surface of the aggregate pier shall be recompact prior to completing subgrade preparation.
- D. The following criteria shall apply, and a written inspection report sealed by the project Testing Agency shall be furnished to the Installer to confirm:
1. That water has not been allowed to pond over the aggregate pier subgrade at any time.
  2. That all Aggregate Piers designed for each structure have been exposed in the footing excavation or prior to fill placement.
  3. That immediately before footing construction or fill placement, the tops of Aggregate Piers have been inspected and recompact as necessary with mechanical compaction equipment.
  4. That no excavations or drilled shafts (elevator, etc) have been made after installation of Aggregate Pier elements within the excavation limits described in the Aggregate Pier construction drawings, without the written approval of the Installer or Designer.
- F. Failure to provide the above inspection and certification by the Testing Agency, which is beyond the responsibility of the Aggregate Pier Installer, may void any written or implied warranty on the performance of the Aggregate Pier system.

### **3.5 Plan Location and Elevation of Aggregate Piers**

The as-built center of each pier shall be within 6 inches of the locations indicated on the plans. Piers installed outside of the above tolerances and deemed not acceptable shall be rebuilt at no additional expense.

### **3.6 Rejected Aggregate Piers**

Aggregate Pier elements installed beyond the maximum allowable tolerances shall be abandoned and replaced with new piers, unless the Engineer approves the condition or provides other remedial measures. All material and labor required to replace rejected piers shall be provided at no additional cost, unless the cause of rejection is due to an obstruction or mislocation.

### **3.7 QUALITY CONTROL**

#### **Control Technician**

The Installer shall have a full-time, on-site Control Technician to verify and report all installation procedures. The Installer shall immediately report any unusual conditions encountered during installation to the Aggregate Pier Designer, the General Contractor, and to the Testing Agency. The quality control procedures shall include the preparation of Aggregate Pier Progress Reports completed during each day of installation containing the following information:

## ADDENDUM NO. 4, SEPTEMBER 12, 2014

1. Footing and Aggregate Pier location.
2. Pre-auger diameter and soil conditions encountered during drilling (if required).
3. Aggregate Pier length.
4. Planned and actual Aggregate Pier elevations at the top and bottom of the Aggregate Pier.
5. Average lift thickness of each Aggregate Pier.
6. Volume of aggregate used in each Aggregate Pier.
7. Documentation of any unusual conditions encountered.
8. Type and size of densification equipment used.

### Aggregate Pier Modulus Test

A minimum of one (1) Modulus Test is required for this project. When authorized, an Aggregate Pier Modulus Test(s) shall be performed at locations agreed upon by the Aggregate Pier Designer and the Testing Agency to verify or modify Aggregate Pier designs. Modulus Test Procedures shall utilize appropriate portions of ASTM D 1143 and ASTM D 1194, as outlined in the Aggregate Pier design submittal. Aggregate Piers shall be tested to 150 percent of the maximum design stress as shown in the aggregate pier design submittal. The modulus tests shall be of the type and installed in a manner specified herein.

- A. A telltale shall be installed at the bottom of the test pier so that bottom-of-pier deflections may be determined. Acceptable performance is indicated when the bottom of the pier deflection is no more than 30% of the top of pier deflection at the design stress level.
- B. ASTM D-1143 general test procedures shall be used as a guide to establishing load increments, load increment duration, and load decrements. As a minimum, the following loading increments, decrements and duration shall be used.

<u>Increment</u>	<u>Approximate Load</u> <u>( percent design)</u>	<u>Minimum</u> <u>Duration (min)</u>	<u>Maximum</u> <u>Duration (min)</u>
Seat	< 9	0	N/A
1	17	15	60
2	33	15	60
3	50	15	60
4	67	15	60
5	83	15	60
6	100	15	60
7	117	60	120
8	133	15	60
9	150	15	60
10	100	N/A	N/A
11	66	N/A	N/A
12	33	N/A	N/A
13	0	N/A	N/A

- C. With the exception of the load increment representing approximately 117% of the design maximum top of Aggregate Pier stress, all load increments shall be held for a minimum of 15 minutes. Loads are then maintained until the rate of deflection reduces to 0.01 inch per hour or for the maximum of 1 hour, whichever is occurs first.
- D. The load increment that represents approximately 117% of the design maximum stress on the Aggregate Pier shall be held for a minimum of 15 minutes. Loads are then maintained until the rate of deflection reduces to 0.01 inch per hour or for the maximum of 4 hours, whichever is occurs first.

- E. A seating load equal to 5 percent of the total load shall be applied to the loaded steel plate prior to application of load increments and prior to measurement of deflections to compensate for surficial disturbance.

**Bottom Stabilization Testing (BSTs) / Crowd Stabilization Testing (CSTs)**

Bottom stabilization testing (BSTs) or Crowd stabilization testing (CSTs) shall be performed by the Control Technician during the installation of the modulus test pier. The tests are performed by applying downward vertical energy to the tamper, mandrel or probe following lift construction and monitoring the amount of additional deflection from the applied energy. Additional testing as required by the Aggregate Pier Designer (typically 10% of the production Aggregate Piers) shall be performed on selected production Aggregate Pier elements to compare results with the modulus test pier.

**3.8 QUALITY ASSURANCE**

**Independent Engineering Testing Agency (Owner's Quality Assurance)**

The Aggregate Pier Installer shall provide full-time Quality Control monitoring of Aggregate Pier construction activities. The Owner or General Contractor is responsible for retaining an independent engineering testing firm to provide Quality Assurance services.

**Responsibilities of Independent Engineering Testing Agency**

- A. The Testing Agency shall monitor the modulus test pier installation and testing. The Installer shall provide and install all dial indicators and other measuring devices.
- B. The Testing Agency shall monitor the installation of Aggregate Piers to verify that the production installation practices are similar to those used during the installation of the modulus test elements.
- C. The Testing Agency shall report any discrepancies to the Installer and General Contractor immediately.
- D. The Testing Agency shall observe the excavation, compaction and placement of the foundations as described in Section 7.05. Dynamic Cone Penetration testing may be performed to evaluate the footing bottom condition as determined by the Testing Agency.
- E. The Testing Agency shall observe subsurface soils are consistent with the design assumptions.

**PART 4 - PAYMENT**

**4.1 GENERAL**

- A. Separate measurement and payment will not be made for the work of this section, but all costs in connection therewith are included in the Contract Lump Sum Price for Item No. 745.01 – Bus Rapid Transit Stations.

**END OF SECTION**

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# Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

9/10/2014

Revision

Date:

9/10/2014

PRINTED

City/Town: Chelsea	Project File #: 604428	PUC Completed by: J. Goyne/A. Christakis	Utility Pole Set: Nstar Electric
Route/Street: Silverline Busway & Washington Ave. Bridge	Resident Engineer: <i>To be determined.</i>	Mass DOT PM: Joseph Pavao Jr.	Scheduled Ad Date: 7/19/2014
Total Poles Relocated:			6 utility poles and 8 high tension power line poles

Consultant:			Contact:		Office #		Cell #		Email						
AECOM			Francis Astone		(978) 905-2173				Francis.Astone@aecom.com						
Utility Company	Contact	Office #	Cell #	Email	Scope, Budget, Duration Submitted		Reimbursement			Potential for District Initiated Early Relocation *		Utilities On Bridge/Structure		Utilities Underground (UG) /Aerial (OH)	
					Yes	No	Agreement	Non-Reimb'l'e	Notes	YES	NO	YES	NO	UG	OH
Nstar Electric (Distribution)	Aruna Sikharam	(617) 369-5533		aruna.sikharam@nu.com	X		X		Nstar distribution lines are currently aerial over the bridge. The new configuration will include new manholes and a duct bank through the bridge.		X		X		X
Verizon	Paul Mirley	(978) 837-6199		paul.d.mirley@verizon.com	X		X		Verizon shall design and install the temporary support to hold their existing infrastructure through the bridge in place.		X		X		
Comcast	Earle Lawson	(617) 279-1925		earle.lawson@cable.comcast.com	X		X		Comcast lines are currently aerial over the bridge. The new configuration will include new manholes and two conduits through the bridge.		X		X		X
National Grid Gas	Tommy Fang	(617) 438-0718		tommy.fang@nationalgrid.com	X		X		Only if the relocation work is deemed necessary. Contractor to avoid unnecessary relocation.		X		X		
Chelsea Water	Andrew B. DeSantis	(617) 466-4206		adesantis@chelseama.gov		X			Water work will be included in the MassDOT contract.		X			X	
Chelsea Fire	Allan Alpert	(617) 466-4660		aalpert@chelseama.gov	X		X		Verizon will provide duct for Chelsea Fire Alarm		X		X		X
Crown Castle	Joseph Guido	(917) 563-3684	(914) 420-2123	joseph.guido@crowncastle.com	X		X		Crown Castle lines are currently aerial over the bridge. Verizon may provide duct for Crown Castle. Otherwise, a dedicated duct for Crown castle is required.		X		X		X
MBTA	John McCormack			jmcormack@mbta.com	X		X				X		X		
Nstar Electric (Transmission)	David Amann			David.Amann@nu.com					Transmission line relocation may be eligible for up to 100% reimbursement based upon meeting performance criteria.				X		X
BCE Nexxia	Gillian Birch	(905) 614-4794		gillian.birch@bell.ca	X			X	Concrete protection of duct bank due to loss of cover as required by MassDOT. Hand-hole replacement, markers and supervision as required by BCE Nexxia.				X		

Unless otherwise noted by Contract, the MassDOT Contractor is to provide the District Construction Office <b>with 7 Calendar Days advance</b> notification in order to validate the current progress and provide the required 30 Days advance notice-to-proceed for the first Utility - and each subsequent Utility. These advance notifications are to be identified in the Contractor's Schedules (Pre-Con preparation, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02 (for DBB Contracts) and/or Section 9 (of DB Contracts). Note: The durations included below do not include these lead-times. See Additional 'Important Basis notes for Contractor' - on last PUC Form page.
Additional notes:
Please note that the Utilities on Bridge/Structure refers to existing facilities and not proposed final locations. Existing aerial utilities over the Washington Avenue bridge shall be relocated underground and through the new bridge. The BCE Nexxia network is located within the limits of the proposed busway. Note that no excavation/ground works shall be performed prior to confirming network location by test pit and that no excavation/ground works shall be performed within 2 meters (measured vertically and horizontally) of confirmed locates without a BCE Nexxia approved inspector present. See Conditions for Working Around the Network of BCE Nexxia for further details.
<b>Suggested Sequence of Relocation ( Based on Consultant proposed construction staging)</b> <i>The sequence as detailed on the following pages is based on the consultants proposed staging plan. This information was compiled through meetings that included all of the utilities listed below along with the designer and the City of Chelsea. The information provided is the best available information prior to project advertisement.</i>



Is 'enabling' (prep) work, by the Contractor, necessary prior to the start of the first series of utility relocations:		Yes	No
		X	

Has any of the Utility work been identified to work concurrently		Yes	No
		X	



9/10/2014  
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DESCRIPTION - Utility Relocation Phases, Tasks and Activities

RESPONSIBLE PARTY	C = Contractor U = Utility Co.		Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the information in these 4 columns is intended to supplement any related Access Restraints that are described in the Special Provisions.				Access Restraint (AR) & Limitations of Operations Notes
				Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent	
Bridge Stage 1				Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction operations on-site (while Utility is working)	Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)
				Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction operations on-site (while Utility is working)	Contractor and Utility are working on-site - but NOT in the same vicinity	Reason/Note (optional)
UTILITY OPERATIONS - Underground								
Task: 1								
	U	Excavate test hole to determine location of existing underground facilities. Excavate gas main squeeze off pit. Install gas stopper equipment. Squeeze off gas main. Cut & cap gas main. Transfer existing gas service, if necessary. Backfill and restore trench.	3		X		X	
		Sub-Total	3					
Task: 2								
		Nstar Electric						
	U	Install 4 new poles poles/wire, #1, 2, 3 and 2/10 as indicated	4	X			X	
	U	Install 2 manholes (6x10x8)	10		X		X	Y
	C	Install 6-5" FRE from MH #1 to MH #2 (+/- 250')	10				X	MassDOT contractor performing work
	C	Install 2-5" PVC EB from P2/10 Highland to MH #2 (+/- 25')	2				X	MassDOT contractor performing work
	C	Install 2-5" PVC EB from new P3 Heard to MH #1 (+/- 150')	6				X	MassDOT contractor performing work
	C	Install 2-5" PVC EB from new P2 Highland to MH #1 (+/- 10')	2				X	MassDOT contractor performing work
		Sub-Total	34					
Task: 3								
		Verizon						
	U	"White Mtn Cable" to place new split Manhole 50 and lateral ducts to MH 50A + 49	10	X			X	
	U	Verizon to place new cables from New MH 50 to MH 49 + 50A	2		X		X	
	U	Verizon to splice and cut-over working facilities in these cables	24	X			X	
	U	Verizon to remove old cables	2	X			X	
	U	"White Mtn Cable" to remove old manhole and ducts	2		X		X	
	U	American U-Tel to expose the existing ducts in the EAST sidewalk and excavate back to the beam support pos.	10		X		X	
	U	American U-Tel to transport and install the 135ft beam and temp support the existing ducts and cables	5	X			X	
	U	American U-Tel to position the cables and ducts within the new utility bay and install split fiberglass duct and hanging supports	10		X		X	
		Sub-Total	65					
Task: 4								
		Comcast						
	U	Placement of new Comcast manhole at the intersection of Heard & Washington Streets	2	X			X	
	U	Placement of conduits from P#1 Heard St. to new manhole	3	X			X	
	U	Placement of conduits from P#10 Washington St. to new manhole	3	X			X	
	U	Placement of conduits from P#12 Washington St. to manhole	3	X			X	
	U	Pulling of new fiber optic cables from Heard St. to Washington St.	10		X		X	
	U	Pulling of new coax cables from Heard St. to Washington St.	3		X		X	
		Sub-Total	24					

RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work				Access Restraint (AR) & Limitations of Operations Notes	
				Contractor	Utility Co.	Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent
Bridge Stage 2	C = Contractor	Enabling' work by the Contractor - Possible minor site work for overhead relocations. For Verizon's underground work, the existing west portion of the bridge deck will need to be removed so American U-Tel can place the support beam for Verizon's existing duct. Comply with BCE Nexxia vibration limits and conditions for working around the network (underground in the busway below) during the demolition of the existing bridge pier.			Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction on-site (while Utility is working)	Contractor and Utility are working on-site - but NOT in the same vicinity	
		UTILITY OPERATIONS - Underground							
		Verizon							
		U American U-Tel to expose the existing ducts in the WEST sidewalk and excavate back to the beam support positions	10			x		x	
		U American U-Tel to excavate back to install 135ft beam and temp support the existing ducts and cables	5	x				x	
		U American U-Tel to position the cables and ducts within the new utility bay and install split fiberglass duct and hanging supports	10			x		x	
Task: 1		U American U-Tel to return 135ft beam to Verizon storage yard	1	x				x	
		Sub-Total	26						
		UTILITY OPERATIONS - Aerial							
		Nstar Electric							
		U Install Cable	5	x				x	
		U Splicing	5	x				x	
Task: 1		U Install overhead equipment	6	x				x	
		U Build Riser	8	x				x	
		U Frame Poles	6	x				x	
		U Install Wire	12	x				x	
		U Install transformers	1	x				x	
		U Remove poles P11/1, P2/11 & P31/1	3	x				x	
Task: 2		U Install new poles #21 & #22 on Spruce Street	4			x		x	
		U Install guy anchors	1			x		x	
		U Install Wire and transformers	3			x		x	
		U Remove poles P21, P22	3			x		x	
		Sub-Total	57						
		Crown Castle							
Task: 2	C	Provide a conduit pathway from pole #2, across the bridge to the new 2/10 pole in the event that Crown Castle cannot be accommodated in the Verizon duct bank, as required.							
		U Wreck out existing aerial fiber from utility poles	1						
		U Re-install aerial and underground fiber cable into conduit. Underground conduit and pole riser sweeps to be provided by others.	3						
		U Re-splice fiber cable at both ends. Test and reconnect node.	1						
		Sub-Total	5						
		Chelsea Fire Department							
Task: 2		U Run cable, install fiber	1						
		U Connections & Testing	1						
		U Demo Existing cables	1						
		Sub-Total	3						
		Comcast							
		U Schedule of splicing of Fiber Cables (90 days notice)	5	x					
Task: 2		U Schedule of splicing of Coax Cables	5	x					
		U Schedule of wreck out of aerial coax and fiber from poles	3			x			
		Sub-Total	13						
		Enabling' work by the Contractor - Site work for overhead relocations. BCE Nexxia underground network to stay in place whenever possible. The contractor shall, at the direction of the Engineer and under the supervision of BCE Nexxia, encase the network in concrete wherever the minimum cover limits are not satisfied. The contractor shall comply with the BCE Nexxia vibration limits and conditions for working around the network while constructing the new busway. This work (test pits and concrete encasement) should happen as early as possible.							
		Busway Stage 1							



RESPONSIBLE PARTY	DESCRIPTION - Utility Relocation Phases, Tasks and Activities		Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work				Access Restraint (AR) & Limitations of Operations Notes	
				Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent		
C = Contractor	U = Utility Co.			Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction on-site (while Utility is working)	Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
UTILITY OPERATIONS - Aerial									
Task: 1	<b>Nstar Electric Transmission</b>								
C		Nstar shall relocate eight (8) transmission poles and power lines that are in conflict with the proposed busway. Note the seasonal constraints for transferring the transmission power lines to the new poles.							
		<b>Sub-Total</b>	<b>0</b>						
Task: 2	<b>MBTA</b>								
	U	Remove existing RR signal under the Route 1 viaduct.							
	U	Signal personnel to install conduit under tracks at the Downtown Chelsea Station							
	U	Relocation of overhead power & signal cables at Spruce Street							
	U	Relocate Grease Box located between Washington and Broadway at Station 48+80							
	U	Relocate Storage Containers located along outbound platform at the commuter rail station							
	U	Track/paving Crew to install temp. asphalt platform & crossings at existing CR Station							
		<b>Sub-Total</b>	<b>0</b>						
Task: 3	<b>Nstar Electric Distribution</b>								
	U	Install new poles #21 & #22 on Spruce Street	4		x		x		
	U	Install guy anchors	1		x		x		
	U	Install Wire and transformers	3		x		x		
	U	Remove poles P21, P22	3		x		x		
		<b>Sub-Total</b>	<b>11</b>						
UTILITY OPERATIONS - Underground									
Task: 1	<b>BCE Nexxia</b>								
C		Encase the BCE Nexxia network with concrete as directed by the Engineer and under the supervision of an authorized BCE Nexxia representative.							
		<b>Sub-Total</b>	<b>0</b>						
IMPORTANT BASIS NOTES - FOR CONTRACTOR									
1	Unless otherwise specified in the MassDOT Construction Contract, or unless specifically noted within this PUC Form, these durations (herein) are based upon the Contractor providing <i>unimpeded access</i> to the Utility company to perform Utility relocations (see Note 5 - Access).								
2	"Concurrent Utilities" operations noted herein, are to signify those Utility Company operations that can be worked concurrently (e.g. Utility A and Utility B work on-site together) - MassDOT and the Contractor are to prepare NTPs to Utilities accordingly.								
3	"Potential Access Restraints" noted within this PUC Form are for planning purposes. See MassDOT Contract for Contractual Access Restraints (refer to Subsections 8.02, 8.03, and/or 8.06 for Design Bid Build Contracts and Volume II Section 9 for Design Build Contracts).								
4	Utility non-work periods - For planning purposes, the durations above contain some non work days (contingency) for New England conditions (precipitation, high temperatures, low temperatures, snow, ice). Gas line work however, typically has a seasonal restriction and can NOT be installed from 15-November to 15-March. Municipally Owned Electric and Gas Utilities are also restricted from proceeding from 15-November to 15-March. All of the Telco's have "Embargos" in place during high demand periods (during Christmas/New Years, SuperBowl, Investing / RRSP season). Any work that could be service impacting cannot be performed and the network cannot be exposed during these times. Nstar Electric can only transfer the transmission power lines to the new poles during the spring and fall low demand windows. The Contractor shall (and the CTD plan) reflect this calendar restriction within the schedule (unless otherwise note).								
5	Access - Unless otherwise noted in the Contract, and in addition to the 'enabling' notes above, the Contractor must provide safe and unimpeded access (for trucks, lifts, cranes, etc.) to the Utilities, to allow for the proposed relocation(s) - including but not limited to snow removal, clearing and grubbing, guard rail removal, barrier removal, tree removal, and grading.								

RESPONSIBLE PARTY	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the information in these 4 columns is intended to supplement any related Access Restraints that are described in the Special Provisions.				Access Restraint (AR) & Limitations of Operations Notes	
			Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent	Potential Access Restraint (Yes/No)	Reason/Note (optional)
C = Contractor	DESCRIPTION - Utility Relocation Phases, Tasks and Activities		Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction on-site (while Utility is working)	Contractor and Utility are working on-site - but NOT in the same vicinity		
U = Utility Co.		6	For all MassDOT construction contracts issued after January 2014, the new Utility Coordination/documentation specification is required. This is Section 8.14 in Design-Bid-Build Contracts (see Design-Build index reference for applicable section #).					
		7	Prior to starting any and all enabling work for Utilities, the Contractor is to plan in advance with submittals and approved durations.					
		8	* Potential District Initiated Early Utility Relocation - if noted herein, the District reserves the right to initiate early utility relocation in advance of the Contract NTP. In submitting a bid price and in the development/basis of the Baseline Schedule, the Contractor shall not plan the Work with the potential benefit of any form of 'early utility relocation.' As a requirement of the Baseline submission, unless otherwise noted in this Specification, the earliest that the first Utility company is to receive the 30 days advance notification to mobilize to the site, will be 7 calendar days after the pre-construction meeting and never sooner than 7 days after the Contract NTP.					
		9	Please note that most of the utility work is related to the Washington Ave. bridge location. While this form states that the Contractor can work on-site during utility work, typically this means that the Contractor can perform work along the proposed busway but not on Washington Ave. This distinction will need to be discussed between the Contractor, Utility Companies and MassDOT construction personnel.					
		10	Comcast requires a 90 day notification before they will splice their fiber cables.					
		11	Comcast work appears to include the relocation of AT&T cables as well.					
		12	Overhead relocations for each company cannot be completed until the new underground infrastructure is in place. This includes manholes, conduit and necessary fiber and cable. Existing overhead facilities will not be removed until the proposed underground facilities are in place and functional. This is critical for the demolition and construction of the Western portion of the Washington Ave. bridge.					
		13	Nstar Electric's work on Spruce Street is not dependent or related to their work on Washington Ave. and can be completed once the site on Spruce Street has been cleared and the proper easements (if necessary) are in place.					

DOCUMENT A00810

**LICENSED SITE PROFESSIONAL (LSP) OPINIONS  
ON PROPERTIES SUBJECT TO  
ACTIVITY AND USE LIMITATIONS (AUL)**

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AECOM  
250 Apollo Drive  
Chelmsford, MA 01824

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978-905-2101 fax

**Attachment to Form BWSC-113**

September 8, 2014 **DRAFT**

**Subject: Licensed Site Professional (LSP) Opinion for Proposed Silver Line Gateway Project  
Activities at the 151 Everett Avenue, Chelsea Massachusetts site  
RTN: 3-13919**

The Massachusetts Bay Transportation Authority (MBTA) and Massachusetts Department of Transportation (MassDOT) Bus Rapid Transit Silver Line Gateway route expansion to the City of Chelsea Massachusetts includes construction activities that will occur within various abutting areas or properties along the route. One of the properties subject to such Silver Line Gateway construction activities is the 151 Everett Avenue, Chelsea Massachusetts property (the Site). AECOM Environment (AECOM) has completed this LSP Opinion per the Massachusetts Contingency Plan (MCP) in 310 CMR 40.1080 (Changes in Site Activities and/or Uses or Other Site Conditions After a Response Action Outcome with an Activity and Use Limitation Has Been Filed) as an attachment to transmittal Form BWSC-113.

This Site is currently subject to an Activity and Use Limitation (AUL) pursuant to the MCP that includes various restrictions and obligations as a condition for site closure. AECOM concludes that the upcoming Silver Line Gateway activities at the Site will not change the Site's condition of No Significant Risk, as determined in the conclusions provided in the Response Action Outcome (RAO) and supporting risk assessment closure documents for the Site. This LSP opinion is based on the activity and uses and obligations described in the Notice of AUL and on the proposed construction activities to be conducted on a portion of this Site.

The proposed Silver Line Gateway Project will provide a new route, which will begin adjacent to the existing Massachusetts Port Authority (Massport) employee parking garage and continue north and west via the MassDOT-owned former Grand Junction Railroad right-of-way across the city to the Mystic Mall on Everett Avenue. The project will consist of an exclusive 1.3 mile long Busway, construction of four new stations (located at Mystic Mall, Downtown Chelsea, Box District and Eastern Avenue), replacement of the Washington Avenue Bridge, construction of a new Shared Use Path, and relocation of the MBTA Chelsea Center Commuter Rail Station.

**Site and AUL Overview**

The Site is located on the corner of the Everett Avenue and Spruce Street in Chelsea Massachusetts. The MBTA portion of the Chelsea Commuter Rail abuts the property towards the north. As indicated in the RAO submitted by Nangle Consulting Associates, Inc. (NCA) in 1998, the site contaminants detected during preliminary assessment activities were attributed to historic heterogeneous ash fill/rubble material across the site. The source of this fill material was identified as the remains of the Great Chelsea Fire of 1973, at which time numerous buildings located upon the project site were razed. Remedial response actions were completed at the site in March of 1996 through an attempted Limited Removal

Action (LRA) and by NCA in April 1998 as a Release Abatement Measure (RAM). In addition to the remedial response actions, supplemental soil and groundwater investigations were completed by NCA between July 1996 and May 1998.

During the course of site investigatory activities and the risk assessment evaluations, two areas of subsurface impacts were identified and evaluated. The first area (Area A) is located in the northwest corner of the Site where petroleum residuals were initially identified. The second area (Area B) is situated in the southeastern portions of the Site, to the east of the on-site building, where residual chlorinated solvent contamination was identified. Once the remedial response actions and site investigation activities were completed, and as part of the Response Action Outcome (RAO) closure for the Site, a Risk Characterization was generated. The evaluation of risk revealed that a condition of No Significant Risk exists at the Site as long as future potential exposure pathway is eliminated through the implementation of a Notice of AUL. As recommended on the risk evaluation, and as a condition for site closure, an AUL was recorded on the Site on May 20, 1999.

The original 1999 Notice of AUL was subsequently amended on September 12, 2002. The reasons for the amendments were due to various errors identified by MassDEP as part of a routine AUL compliance review/audit for the Site. Some of the errors included the failure to record the AUL with the Land registration Office and to adequately define what uses and activities were permitted and/or restricted at the site, and what obligations and conditions must be maintained at the site. The above errors were corrected and an amended Notice of AUL was recorded with the Suffolk County Registry of Deeds on October 2, 2002.

The original and amended AUL area encompasses the entire boundary of the Site and property. The construction project will most likely disturb (i.e., excavation and removal) the soils in Area A. See Attached **Figure 1** for AUL area and the area of the proposed construction.

#### **AUL and LSP Opinion**

The following activities and uses, which are potentially inconsistent with the objectives of the amended Notice of AUL for this Site (due to the construction activities discussed above), were evaluated as part of this AUL opinion:

- Paragraph 2(ii) - Any use or activity involving the permanent removal or resulting in damage to existing surface cover which would result in a direct contact exposure to underlying urban fill material;
- Paragraph 2(iv) – Activities and uses which involve the relocation of currently inaccessible urban fill material to more accessible locations unless an LSP Opinion has been rendered that concludes that such activities would not violate a condition of No Significant Risk and are consistent with the provisions of the Massachusetts Contingency Plan (MCP);
- Paragraph 3(i) – Existing surface cover, as delineated with Exhibit A, within the boundaries of the AUL area must be maintained to prevent direct contact exposure; and
- Paragraph 3(iv) – Urban fill material located below surface cover within the AUL area may not be re-located unless such activity is evaluated by an LSP who renders an opinion that such activity poses no greater risk or harm to health, safety, public welfare or the environment and is consistent with the provisions of the MCP.



The Silver Line Gateway temporary construction activities at the Site will consist of the excavation of soils within the north and northwest edge of the property (parallel to existing MBTA right-of-way) for the purposes of construction, including Area A, and the subsequent handling and transportation of such soils for offsite disposal. The resulting ground surface will be pavement/roadway. As mentioned previously the entire Site is subject to an AUL. Although soils will be moved and handled during the construction activities, all of the excavated soils and urban fill material will be transported offsite, and not relocated or reused on-site (not moving to a more accessible location), thus maintaining a condition of No Significant Risk. In addition, all disturbed areas (not part of a permanent Silver Line Gateway structure) will be backfilled, restored to conditions consistent with when the AUL was implemented (protecting from possible direct exposure to underlying soils as required by Paragraph 3(i) in the AUL). The change in use will not result in higher exposure to underlying soil and urban fill material. Furthermore, Paragraph 1(ii) in the AUL allows excavation work for construction as long as the surface conditions are restored and that the Soil Management and Health and Safety Plans note below are developed and implemented.

All of the previously discussed activities will be conducted under the directives of site-specific Soil Management and Health and Safety Plans (to protect against direct exposure to the underlying urban fill material during construction). If the amount of soil requiring handling from the Site exceeds 20 cubic yards (hazardous) or 100 cubic yards (petroleum), a MCP Release Abatement Measure Plan will be required to cover the work.

Therefore, based upon the planned Silver Line Gateway construction activities at the Site, and the AUL obligations and requirements for this Site provided above, the upcoming route expansion activities at the Site will not change the "No Significant Risk" conclusions provided in the closure document (RAO Statement) and supporting risk assessment for this Site, assuming that the AUL requirements and construction criteria described above are properly followed.

If you have any questions concerning the information contained herein, please feel free to contact us.

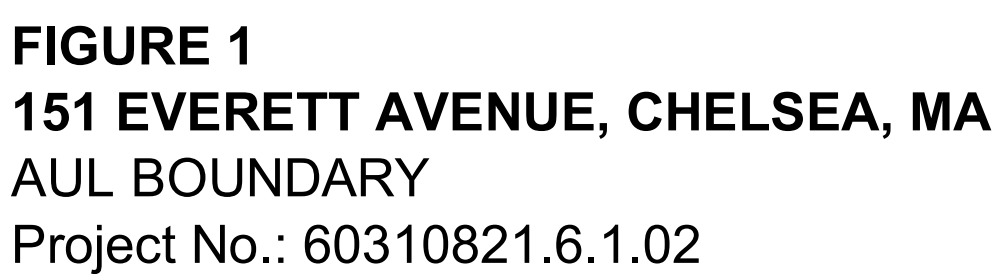
Respectfully,

Raimundo Matos, LSP, PG  
Geologist  
(978) 905-2308

David Austin, LSP, PG  
Senior Project Manager  
(978) 905-2114

Attachment:  
Figure 1









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### **Attachment to Form BWSC-113**

August 29, 2014 **DRAFT**

**Subject: Licensed Site Professional (LSP) Opinion for Proposed Silver Line Gateway Project Activities at the 63 Washington Street, Chelsea Massachusetts Site RTN 3-21047**

The Massachusetts Bay Transportation Authority (MBTA) and Massachusetts Department of Transportation (MassDOT) Bus Rapid Transit Silver Line Gateway route expansion to the City of Chelsea, Massachusetts includes construction activities that will occur within various abutting areas or properties along the Silver Line Gateway route. One of the properties subject to such Silver Line Gateway construction activities is the 63 Washington Street, Chelsea Massachusetts property (the Site). AECOM Environment (AECOM) has completed this LSP Opinion per the Massachusetts Contingency Plan (MCP) in 310 CMR 40.1080 (Changes in Site Activities and/or Uses or Other Site Conditions After a Response Action Outcome with an Activity and Use Limitation Has Been Filed) as an attachment to transmittal Form BWSC-113.

This Site and property is currently subject to an Activity and Use Limitation (AUL) pursuant to the MCP that includes various restrictions and obligations as a condition for site closure. AECOM concludes that the upcoming activities at this Site will not change the Site's condition of No Significant Risk, as determined in the conclusions provided in the Response Action Outcome (RAO) and supporting risk assessment closure documents for the Site, and as required under the Notice of AUL. This LSP opinion is based on the activity and uses and obligations described in the Notice of AUL and on the proposed construction activities to be conducted on a portion of this Site.

The proposed Silver Line Gateway Project will provide a new route, which will begin adjacent to the existing Massachusetts Port Authority (Massport) employee parking garage and continue north and west via the MassDOT-owned former Grand Junction Railroad right-of-way across the city to the Mystic Mall on Everett Avenue. The project will consist of an exclusive 1.3 mile long Busway, construction of four new stations (located at Mystic Mall, Downtown Chelsea, Box District and Eastern Avenue), replacement of the Washington Avenue Bridge, construction of a new Shared Use Path, and relocation of the MBTA Chelsea Center Commuter Rail Station.

#### **Site and AUL Overview**

The Site consists of a parcel of land fronting onto Washington Avenue to the northwest, to the southeast by Chestnut Street, to the south by residential / commercial property, and to the north by MBTA right-of-way and tracks. The site area is approximately 13,960 square feet (sq ft). The Site is occupied by a 6,200 sq ft four-story residential building in the northwest portion (fronting on Washington Street), a paved parking area towards the south, and playground and landscape areas towards the center of the property.

As indicated by McPhail Associates Inc., Earth Tech, Inc. (ETI) completed a RAO and Method 3 Risk Characterization for the Site in April 2002. The risk characterization was performed to evaluate the risks associated with the presence of lead in soil at within the southeastern portion of the Site. According to ETI, the Method 3 Risk Characterization demonstrated that a level of "No Significant Risk" of harm to health, safety, public welfare, and the environment exists at the subject Site. As reported by ETI, with the implementation of an AUL, this finding supports a Class B-2 RAO. Although the elevated lead concentrations were only detected in the southeastern portion of the site, ETI implemented the AUL on the entire subject site, including the central and northwestern area.

In November 2003, McPhail Associates, Inc. conducted a supplemental investigation on the central portion of the Site. Based on total lead analyses conducted on soil samples obtained from soil probes, a Method-1 Risk Characterization was completed for the central portion of the Site in support of a Class B-1 RAO. Based upon the Method 1 Risk Assessment for the central portion of the site and the ETI Method 3 Risk Assessment for the remainder of the Site, a Permanent Solution was achieved and a level of No Significant Risk was determined to exist on the central portion of the site without the implementation of an AUL. However, the remaining portions of the site (both the northwestern and southern areas) were to remain covered by an amended AUL.

Although the current AUL encompasses the northwestern and southern areas of the site, the project will most likely disturb the soils within the northwestern area only. As described previously, a four-story residential building is located on the northwestern corner of the Site. See Attached **Figure 1** for the AUL area and the area of the proposed construction.

The construction activities at the Site will result in the excavation and installation of structural underpinning pits under the building floor of the four-story building at the Site (along the northern and western sides). The underpinning pits will be installed to provide structural support to the four-story building's foundation during the construction activities. The underpinning pit activities will require the excavation and removal of soils from various areas within the northwestern corner of the Site. The excavated soils will be transported and disposed offsite.

#### **AUL and LSP Opinion**

The following activities and uses, which are potentially inconsistent with the objectives of the original Notice of AUL for this Site (due to the construction activities discussed above), were evaluated as part of this AUL opinion:

1. Paragraph 2(ii) – Relocation of lead impacted soil from beneath the pavement or concrete building floor in the AUL area unless an LSP renders an Opinion which states that such relocation is consistent with maintaining a conditions of No significant Risk; and
2. Paragraph 2(iii) – Activities which may cause physical or chemical deterioration, breakage, or structural damage to the pavement or concrete floor.

The temporary Silver Line Gateway and Washington Avenue Bridge construction activities at the Site will consist of the excavation of soils within the northwest corner of the property as part of the installation of structural underpinning pits along the northern and western sides of the four-story building at the Site. Although soils will be moved and handled during the underpinning pit activities, all of the excavated soils will be transported offsite and not relocated or reused on-site or placed where higher exposure would occur, thus maintaining a condition of No Significant Risk. In addition, all disturbed areas will be backfilled, and restored to existing conditions consistent with when the AUL was implemented (thus no remaining damage to pavement or concrete floor). Furthermore, although the project is not emergency or

short-term work, Paragraph 1(iii) permits construction work (3 months or less) assuming Soil Management and Health and Safety Plans are implemented as noted below.

Also, as mentioned previously, although the site impacts were detected within the southern area of the Site, the northwestern area of the Site is also subject to an AUL. Therefore, it is unlikely that impacted soil will be encountered during the underpinning activities. However, as per the current AUL for this Site (Paragraph 3(i) and 3(ii)), all of the soil excavation and handling activities will be conducted under the directives of site-specific Soil Management and Health and Safety Plans. In addition, if the amount of soil requiring handling from the Site exceeds 20 cubic yards, a MCP Release Abatement Measure Plan will be required to cover the work (310 CMR 40.1067(4)).

Therefore, based upon the planned Silver Line Gateway construction activities at the Site, and the AUL obligations and requirements for this Site provided above, the upcoming route expansion activities at the Site should not change the "No Significant Risk" conclusions provided in the closure document (RAO Statement) and supporting risk assessment for this Site, assuming that the AUL requirements and construction criteria described above are properly followed.

If you have any questions concerning the information contained herein, please feel free to contact us.

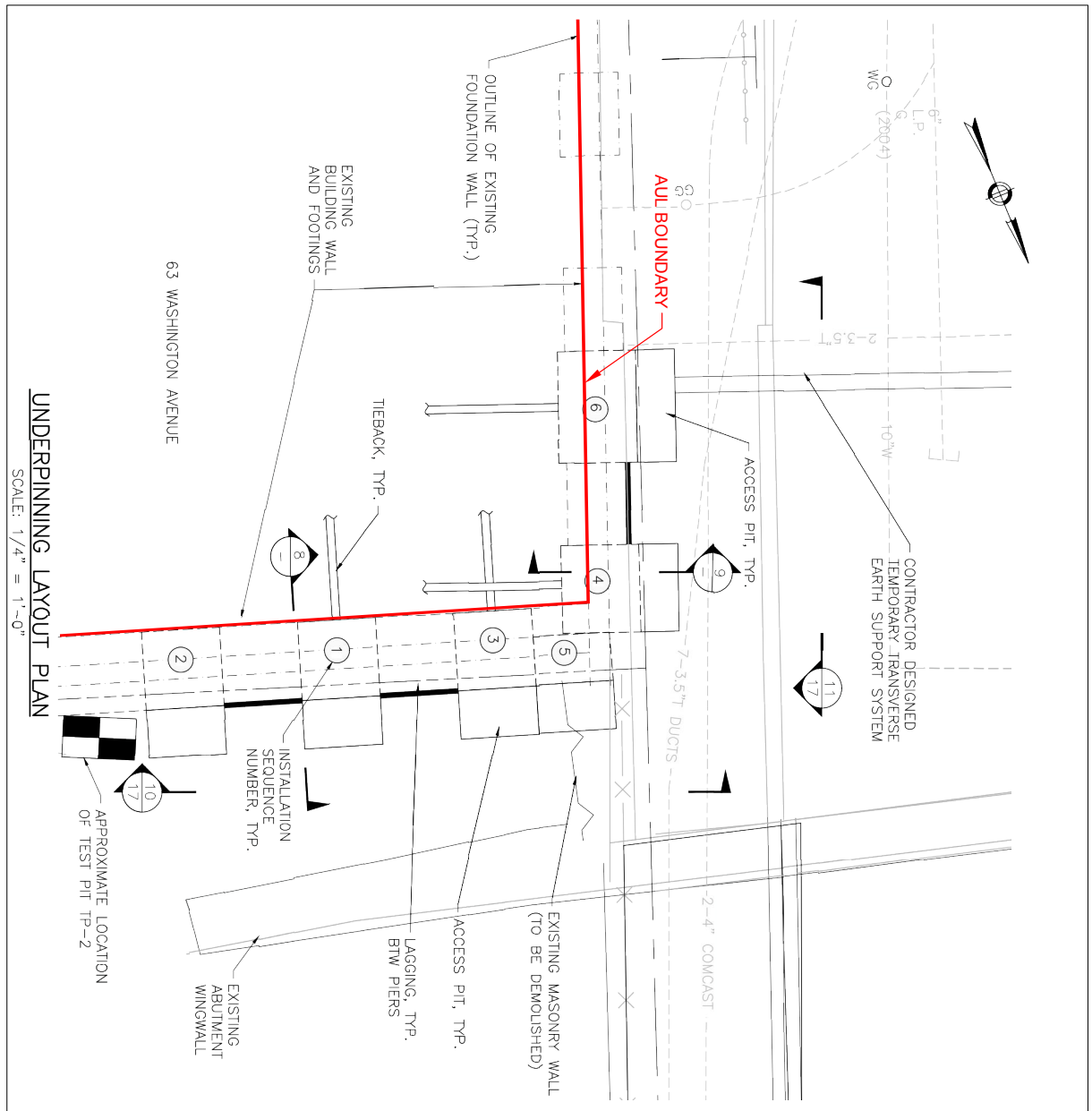
Respectfully,

Raimundo Matos, LSP, PG  
Geologist  
(978) 905-2308

David Austin, LSP, PG  
Senior Project Manager  
(978) 905-2114

Attachment:  
Figure 1

Last saved by: BOUPDEAU (2014-09-08) Last Plotted: 2014-09-08  
 Filename: I:\SWT\PROJECT FILES\MASSHIGHWAY-04489\SILVER LINE\AUL OPINIONS 2014\63 WASHINGTON ST AUL OPINION\ADD63\_WASHINGTON\_AVE.DWG  
 Project Management Initials: Designer: Checked: Approved: ANS I A 8.5" x 11"



**FIGURE 1**  
**63 WASHINGTON AVENUE**  
**AUL BOUNDARY**  
 Project No.: 60310821.6.1.02



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### Attachment to Form BWSC-113

August 29, 2014 **DRAFT**

**Subject: Licensed Site Professional (LSP) Opinion for Proposed Silver Line Gateway Project Activities at the 2 Griffin Way, Chelsea Massachusetts site  
RTN: 3-17722**

The Massachusetts Bay Transportation Authority (MBTA) and Massachusetts Department of Transportation (MassDOT) Bus Rapid Transit (BRT) Silver Line Gateway route expansion to the City of Chelsea Massachusetts includes construction activities that will occur within various abutting areas or properties along the route. One of the properties subject to such Silver Line Gateway construction activities is the 2 Griffin Way, Chelsea Massachusetts property (the Site). AECOM Environment (AECOM) has completed this LSP Opinion per the Massachusetts Contingency Plan (MCP) in 310 CMR 40.1080 (Changes in Site Activities and/or Uses or Other Site Conditions After a Response Action Outcome with an Activity and Use Limitation Has Been Filed) as an attachment to transmittal Form BWSC-113.

This Site is currently subject to an Activity and Use Limitation (AUL) pursuant to the MCP that includes various restrictions and obligations as a condition for site closure. AECOM concludes that the upcoming construction activities at the Site will not change the Site's condition of No Significant Risk, as determined in the conclusions provided in the Response Action Outcome (RAO) and supporting risk assessment closure documents for the Site. This LSP opinion is based on the activity and uses and obligations described in the Notice of AUL and on the proposed Silver Line Gateway activities to be conducted on a portion of this Site.

The proposed Silver Line Gateway Project will provide a new route, which will begin adjacent to the existing Massachusetts Port Authority (Massport) employee parking garage and continue north and west via the MassDOT-owned former Grand Junction Railroad right-of-way across the city to the Mystic Mall on Everett Avenue. The project will consist of an exclusive 1.3 mile long Busway, construction of four new stations (located at Mystic Mall, Downtown Chelsea, Box District and Eastern Avenue), replacement of the Washington Avenue Bridge, construction of a new Shared Use Path, and relocation of the MBTA Chelsea Center Commuter Rail Station.

#### **Site and AUL Overview**

The Site comprises approximately 14.92 acres of land located at 2 Griffin Way in Chelsea, Massachusetts. As indicated in the RAO submitted by Rizzo Associates, Inc. (Rizzo) in March 2003, the Site is located in an industrial portion of Chelsea and is abutted to the north by a MBTA right-of-way, to the east and west by commercial/industrial properties and to the south by MassDOT right-of-way (location of Silver Line Gateway construction). The Site consists of a two-story office building and large warehouse and vehicle maintenance building. The majority of the remainder of the Site is covered with pavement and serving as parking and storage areas for the facility.

Site investigation and remedial response actions, including the removal of various Underground Storage Tanks (USTs) and excavation and treatment of site soils as part of two Release Abatement Measure (RAM) Plans, were conducted at the Site between 1995 and 2002. Additionally, an AUL for the Site was filed in December 1995 for the southern portion of the property. As indicated by Rizzo, the contaminants of concern at the Site are primarily petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and metals in soils. Sources of these materials are likely the result of the previous use and storage of petroleum at the Site, historical operations, and fill materials placed on the Site at various times in the past. Ash, coal, coal slag, and brick pieces have been identified in Site soils.

Utilizing the 1995-2002 information obtained during the various rounds of subsurface investigation at the Site and the implementation of the two RAMs, Rizzo completed a Method 3 Risk Characterization for the Site. The conclusions of the Risk Characterization indicated that in order to achieve and maintain a condition of No Significant Risk at the Site an amendment to the existing AUL was required to restrict certain activities and uses of the property. These activities include those which would cause direct contact with surface and subsurface soils or result in transport of contaminants in soil with another medium. Therefore, an amended AUL was filed with the Suffolk County Registry of Deeds on February 13, 2003. The amended AUL encompasses the entire boundary of the Site and property. The Silver Line Gateway project will most likely disturb (i.e., excavation and removal) the soils located within the southern edge of the Site. See Attached **Figure 1** for AUL area and the area of the proposed construction.

#### **AUL and LSP Opinion**

The following activities and uses, which are potentially inconsistent with the objectives of the original Notice of AUL for this Site (due to the construction activities discussed above), were evaluated as part of this AUL opinion:

- Paragraph 3 (iii) - Any excavation, construction or disturbance of the subsurface soil will require the opinion of an LSP to determine if the proposed work will encounter impacted soils remaining on the site. Should the LSP determine that the work will impact said soil, the preparation of a Health and Safety Plan and an Excavation Plan under guidance of an LSP will be required.

Based upon current site data, it is not possible to determine if the construction will encounter impacted soils; therefore, this opinion assumes that construction activities will be within impacted soils. The Silver Line Gateway temporary construction activities at the Site will consist of the excavation of soils along the southern edge of the Site and property, and the subsequent handling and transportation of such soils for offsite disposal. A BRT station platform and related components will be placed within the AUL area along one portion of the Site and property edge. As mentioned previously the entire Site is subject to an AUL. Although soils will be moved and handled during the BRT construction activities, all of the excavated soils will be transported offsite, and not relocated or reused on-site, thus maintaining a condition of No Significant Risk. In addition, all disturbed areas (not part of a permanent BRT structure) will be backfilled, restored to existing conditions consistent with when the AUL was implemented. Furthermore, Paragraph 1(ii) of the AUL allows short term construction activities assuming it is completed in compliance with the MCP and Soil Management and Health and Safety Plans noted next. Moreover, the proposed activities will not present greater risks as required in Paragraph 1(vi) of the AUL.

All activities will be conducted under the directives of site-specific Soil Management and Health and Safety Plans. If the amount of soil requiring handling from the Site exceeds 20 cubic yards (hazardous) or 100 cubic yards (petroleum), a MCP Release Abatement Measure Plan will be required to cover the work.



Therefore, based upon the planned Silver Line Gateway construction activities at the Site, and the AUL obligations and requirements for this Site provided above, the upcoming route expansion activities at the Site should not change the 'No Significant Risk' conclusions provided in the closure document (RAO Statement) and supporting risk assessment for this Site, assuming that the AUL requirements and construction criteria described previously are properly followed.

If you have any questions concerning the information contained herein, please feel free to contact us.

Respectfully,

Raimundo Matos, LSP, PG  
Geologist  
(978) 905-2308

David Austin, LSP, PG  
Senior Project Manager  
(978) 905-2114

Attachment:  
Figure 1



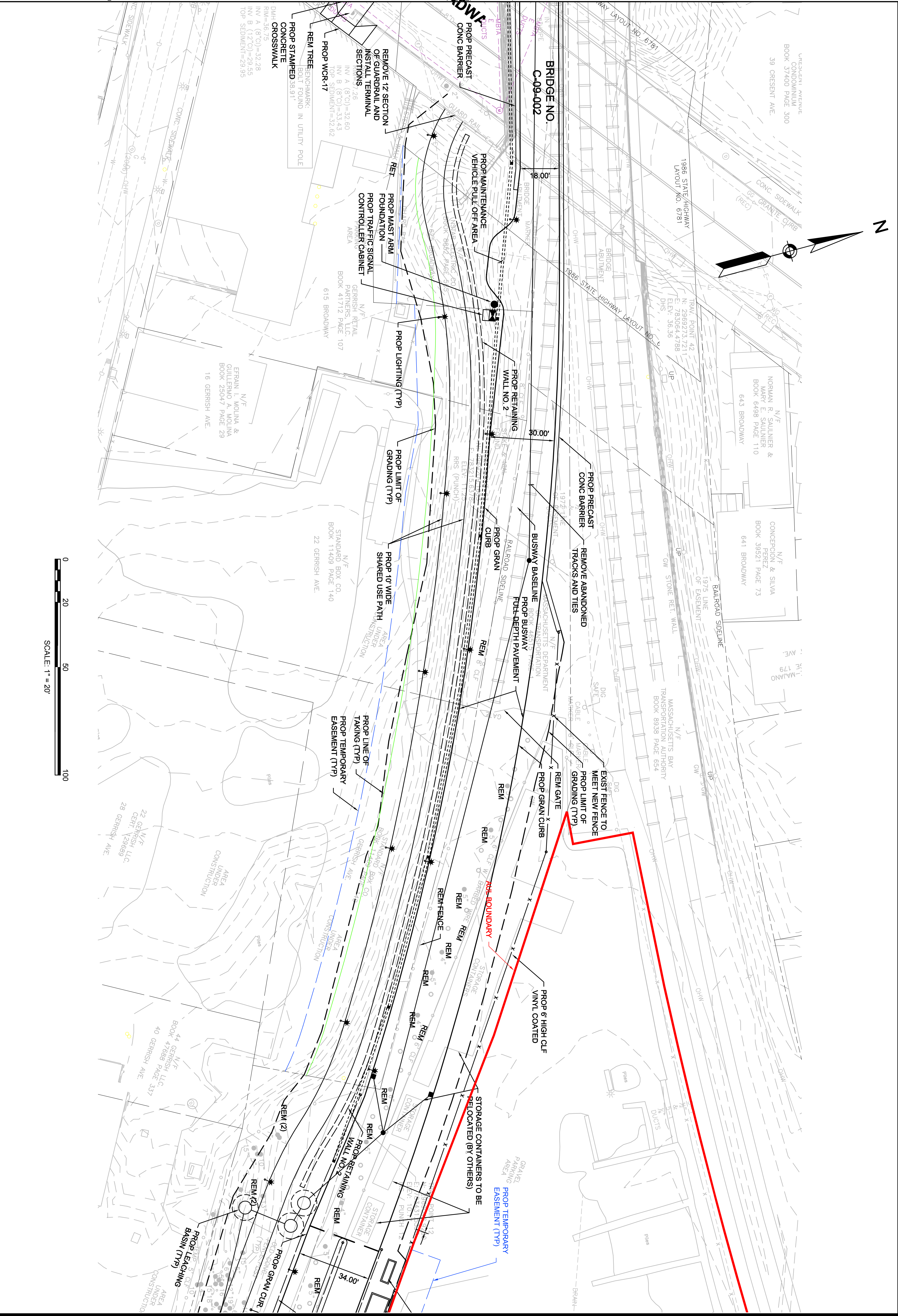
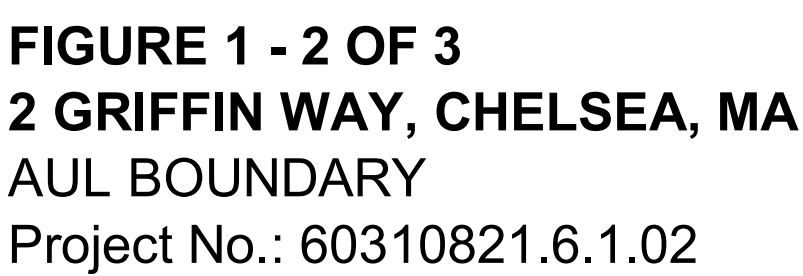


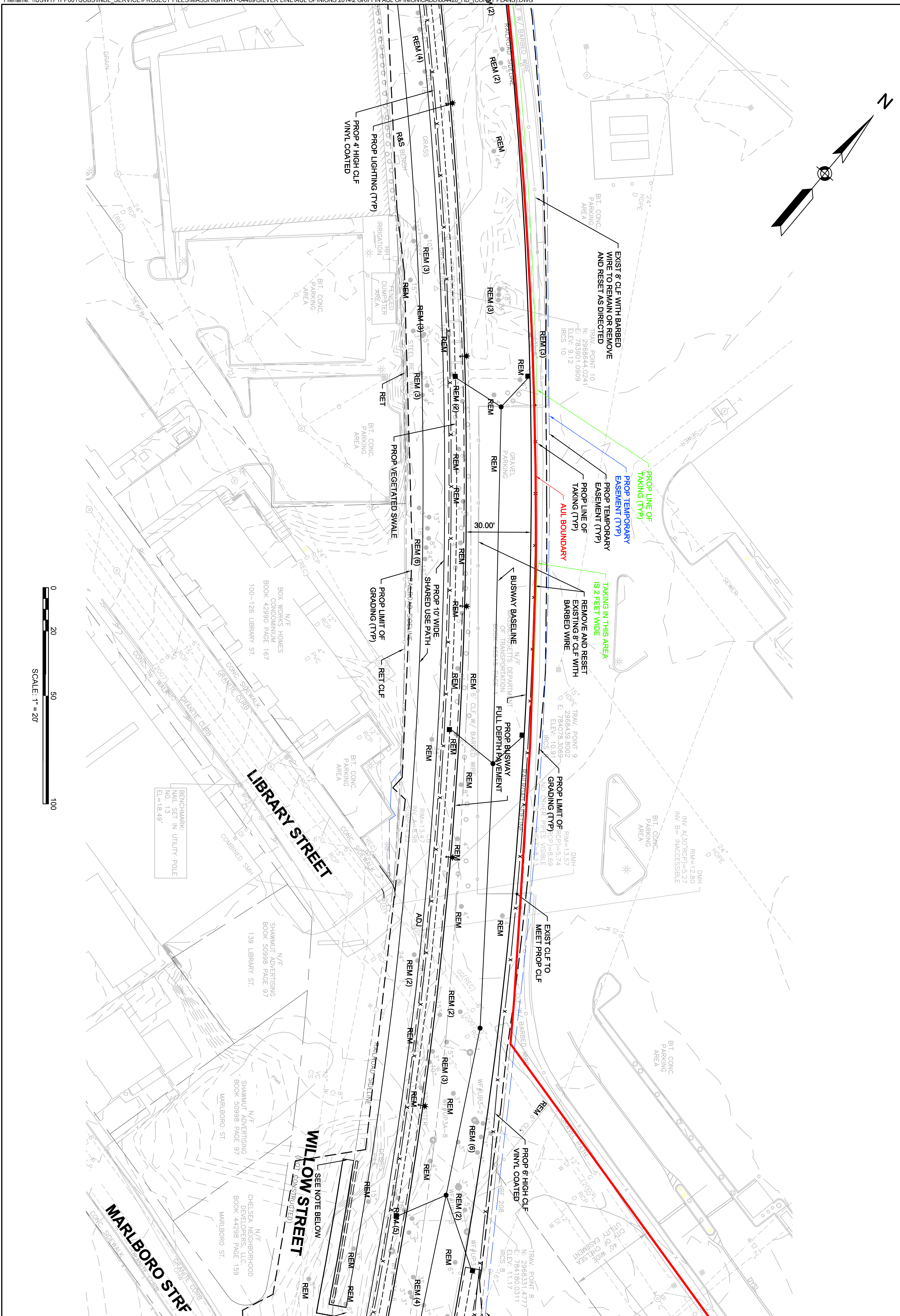
FIGURE 1 - 1 OF 3  
2 GRIFFIN WAY, CHELSEA, MA  
AUL BOUNDARY  
Project No.: 60310821.6.1.02











**FIGURE 1 - 3 OF 3**  
**2 GRIFFIN WAY, CHELSEA, MA**  
**AUL BOUNDARY**  
 Project No.: 60310821.6.1.02



CONST. OF THE SILVERLINE GATEWAY BUSWY,BRT STAS&BRG REPLACEMENT(STEEL)BR.#C-09-  
001 WASHINGTON AVE. OVER THE MBTA RAILROAD

ITEM NUMBER	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
795.079	60	VIBURNUM - WITHEROD 18-24 INCH  AT _____ EACH		
795.081	11	VIBURNUM - WITHEROD 24-30 INCH  AT _____ EACH		
796.100	280	NEPETA 'WALKERS LOW' 1 GAL.  AT _____ EACH		
796.455	536	SWITCH GRASS 2 GALLON  AT _____ EACH		
796.715	380	BLACK EYED SUSAN 2 QUART  AT _____ EACH		
796.725	450	CARDINAL FLOWER 2 QUART  AT _____ EACH		
796.768	31	DAYLILY - 'RED HOT RETURNS'  AT _____ EACH		
796.803	700	NEW ENGLAND ASTER 1 GALLON  AT _____ EACH		
796.817	420	PURPLE CONEFLOWER 2 QUART  AT _____ EACH		
796.900	604	BUTTERLY MILKWEED 2 QUART  AT _____ EACH		

604428-

AE ID: 49987

CHELSEA

CONST. OF THE SILVERLINE GATEWAY BUSWY,BRT STAS&BRG REPLACEMENT(STEEL)BR.#C-09-  
001 WASHINGTON AVE. OVER THE MBTA RAILROAD

ITEM NUMBER	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
796.950	320	GOLDENROD 1 GALLON  AT _____ EACH		
801.42	300	4 INCH ELECTRICAL CONDUIT - TYPE NM (DOUBLE)  AT _____ PER FOOT		
801.44	70	4 INCH ELECTRICAL CONDUIT - TYPE NM (4 BANK)  AT _____ PER FOOT		
801.48	80	4 INCH ELECTRICAL CONDUIT - TYPE NM (8 BANK)  AT _____ PER FOOT		
801.52	100	5 INCH ELECTRICAL CONDUIT - TYPE NM (DOUBLE)  AT _____ PER FOOT		
801.56	120	5 INCH ELECTRICAL CONDUIT - TYPE NM (6 BANK)  AT _____ PER FOOT		
801.58	70	5 INCH ELECTRICAL CONDUIT - TYPE NM (8 BANK)  AT _____ PER FOOT		
804.3	10,000	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL)  AT _____ PER FOOT		
804.4	1,000	4 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL)  AT _____ PER FOOT		
806.4	160	4 INCH ELECTRICAL CONDUIT TYPE RM - GALVANIZED STEEL  AT _____ PER FOOT		

604428-

AE ID: 49987

CHELSEA

CONST. OF THE SILVERLINE GATEWAY BUSWAY, BRT STAS&BRG REPLACEMENT(STEEL)BR.#C-09-  
001 WASHINGTON AVE. OVER THE MBTA RAILROAD

ITEM NUMBER	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
806.41	10	4 INCH ELECTRICAL CONDUIT TYPR RM - SPLIT GALVANIZED STEEL  AT _____ PER FOOT		
810.1	6,500	CONDUIT ENCASED IN CONCRETE  AT _____ PER FOOT		
810.11	3,000	EXISTING CONDUIT ENCASED IN CONCRETE  AT _____ PER FOOT		
811.22	90	ELECTRIC HANDHOLE - SD2.022  AT _____ EACH		
811.31	37	PULL BOX 12 X 12 INCHES - SD2.031  AT _____ EACH		
815.1	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 1  AT _____ LUMP SUM		
815.2	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 2  AT _____ LUMP SUM		
815.3	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 3  AT _____ LUMP SUM		
815.4	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 4  AT _____ LUMP SUM		
815.6	1	SIGNAL TIMING ADJUSTMENT FOR BROADWAY/CARY AVENUE  AT _____ LUMP SUM		

604428-

AE ID: 49987

CHELSEA

CONST. OF THE SILVERLINE GATEWAY BUSWY,BRT STAS&BRG REPLACEMENT(STEEL)BR.#C-09-001 WASHINGTON AVE. OVER THE MBTA RAILROAD

ITEM NUMBER	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
815.7	1	EMERGENCY PRE-EMPTION INSTALLATION@BROADWAY/CARY AVE INT.  AT _____ LUMP SUM		
815.8	1	INSTALL TEMP FULL VEHICLE SIGNAL CONTROL@WASHINGTON/CARY  AT _____ LUMP SUM		
820.10	1	HIGHWAY LIGHTING - ROADWAY  AT _____ LUMP SUM		
823.70	6	HIGHWAY LIGHTING POLE AND LUMINAIRE REMOVED AND RESET  AT _____ EACH		
832.	850	WARNING-REGULATORY AND ROUTE MARKER - ALUM. PANEL (TYPE A)  AT _____ PER SQUARE FOOT		
833.5	40	DEMOUNTABLE REFLECTORIZED DELINEATOR - GUARD RAIL  AT _____ EACH		
833.7	8	DELINEATION FOR GUARD RAIL TERMINI  AT _____ EACH		
847.1	150	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL  AT _____ EACH		
850.	1	CONSTRUCTION NOISE CONTROL  AT _____ LUMP SUM		

604428- AE ID: 49987 CHELSEA



CONST. OF THE SILVERLINE GATEWAY BUSWY,BRT STAS&BRG REPLACEMENT(STEEL)BR.#C-09-001 WASHINGTON AVE. OVER THE MBTA RAILROAD

ITEM NUMBER	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
996.02	1	WALL STRUCTURE, WALL NO. 2  AT _____ LUMP SUM		
996.03	1	WALL STRUCTURE, WALL NO. 3  AT _____ LUMP SUM		
996.04	1	WALL STRUCTURE, WALL NO. 4  AT _____ LUMP SUM		

Total	620,773
Qty:	

**Total:**

604428- AE ID: 49987 CHELSEA

**ADDENDUM NO. 2, SEPTEMBER 3, 2014**

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# **MBTA SUB-CONTRACTOR APPROVAL REQUEST FORM**

**ADDENDUM NO. 4, SEPTEMBER 12, 2014**

**MBTA SUB-CONTRACTOR APPROVAL REQUEST FORM**

**Date:** \_\_\_\_\_

**Contract No.** \_\_\_\_\_

**Contract Title:** \_\_\_\_\_

**Sub-Contractor Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Phone No.:** \_\_\_\_\_

**Project Superintendent:** \_\_\_\_\_

**Project Superintendent E-Mail Address:** \_\_\_\_\_

**Sub-Contractor's Company Tax ID Number:** \_\_\_\_\_

**Specification Section and Scope of Work :**

\_\_\_\_\_  
\_\_\_\_\_

**Estimated Contract Value: \$** \_\_\_\_\_

**Form A – Work History Attached** \_\_\_\_\_

-----  
**MBTA Project Manager**

**MBTA Review:**

\_\_\_\_\_ **Approved**

\_\_\_\_\_ **Not Approved**

-----  
**MBTA Director QA/QC**

-----  
**Date**

**Reason for Disapproval:** \_\_\_\_\_

ADDENDUM NO. 4, SEPTEMBER 12, 2014

**FORM A****SUBCONTRACTOR WORK HISTORY**

<b>Date Project Completed (Month/Year)</b>	<b>Project Title/Location (City, State)</b>	<b>Contract Value (\$)</b>	<b>Description of Work</b>	<b>Client Name/Phone Number</b>

**ADDENDUM NO. 4, SEPTEMBER 12, 2014****Sub-Contractor Approval Request Instructions**

1. The general contractor shall submit to the MBTA Project Manager the required sub-contractor information including general company information, and a completed Form A Work History. All blanks on page 1 of the request need to be completed.
2. The Form A Work History should include a minimum of five (5) completed projects finished within the last ten (10) years. The completed projects listed in Form A should be relevant to the proposed work, and the project information should be complete and accurate. Both MBTA projects and non-MBTA projects can be submitted for review. A sub-contractor prepared work history list that includes all the required information is an acceptable alternative to completing the Form A – Work History attachment if all the required Form A information is included in the sub-contractor work history list.
3. The MBTA Project Manager completes the top section of the Sub-Contractor Approval Request based on information provided by the general contractor. First tier sub-contractors including plumbers, HVAC, electricians, painters etc. must be submitted for approval. The following second tier sub-contractors must also be submitted for approval:
  - A. Structural Steel Fabricators and Erectors
  - B. Miscellaneous Metal Fabricators and Erectors
4. The MBTA QA/QC should be contacted if there are any questions on which sub-contractors should be submitted for approval.
5. All sub-contractor approval requests should be submitted to the MBTA QA/QC Lab a minimum of one week prior to the sub-contractor starting work.
6. The MBTA Project Manager shall review the sub-contractor approval request prior to submission, verify the Form A is attached and filled out correctly, sign the request, and forward to MBTA QA/QC.
7. The MBTA QA/QC will review the request and forward a decision to the MBTA Project Manager. If the request is not approved, the general contractor shall make the necessary corrections and re-submit for approval.
8. Once approved, the MBTA Project Manager will forward all sub-contractor approvals to the MBTA Resident Engineer.
9. If the MBTA Resident Engineer observes an unapproved sub-contractor starting work, the sub-contractor must stop work, and a Sub-Contractor Request must be submitted by the MBTA Project Manager to MBTA QA/QC.

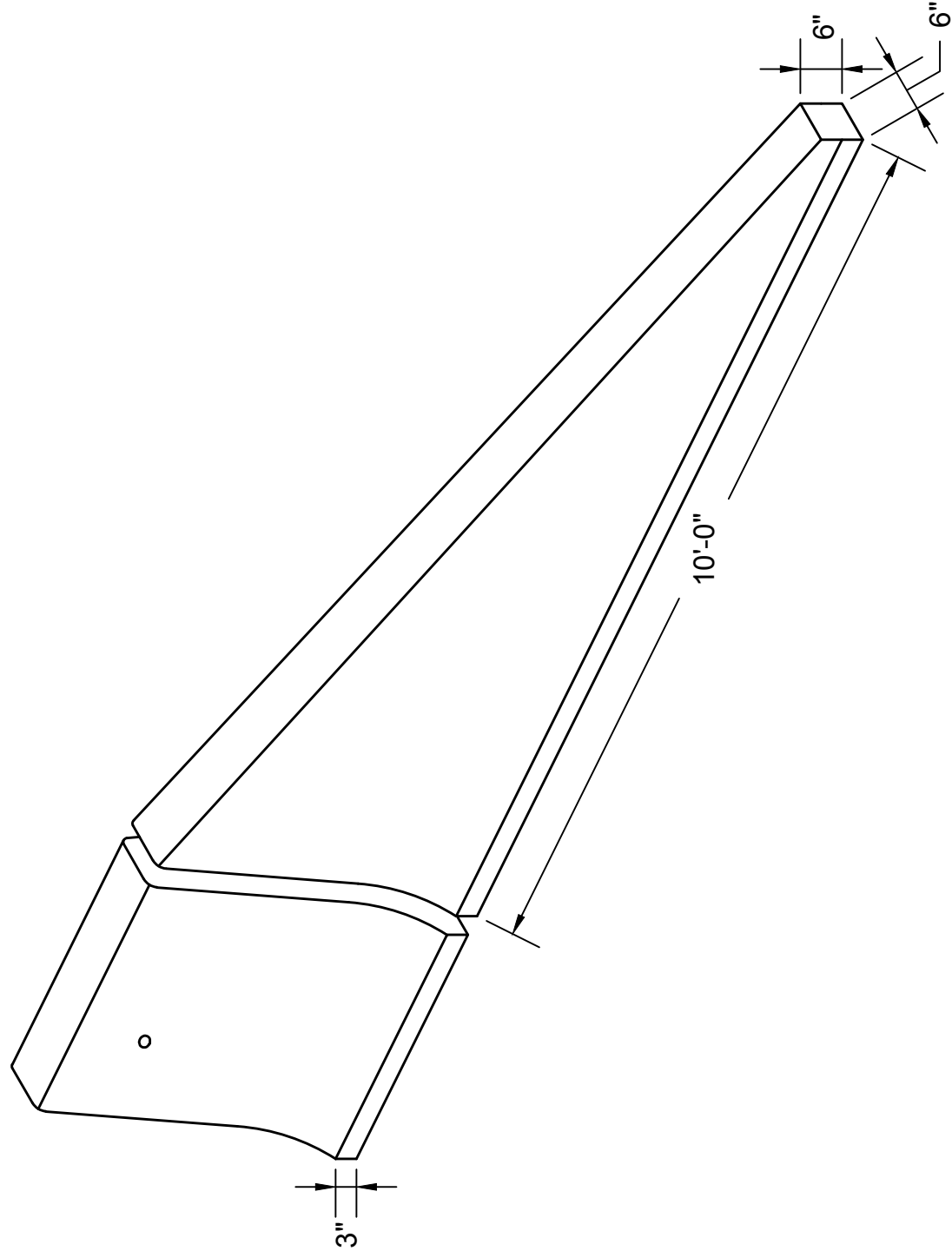
\*\*\* END OF SECTION \*\*\*

CHELSEA

SILVER LINE GATEWAY

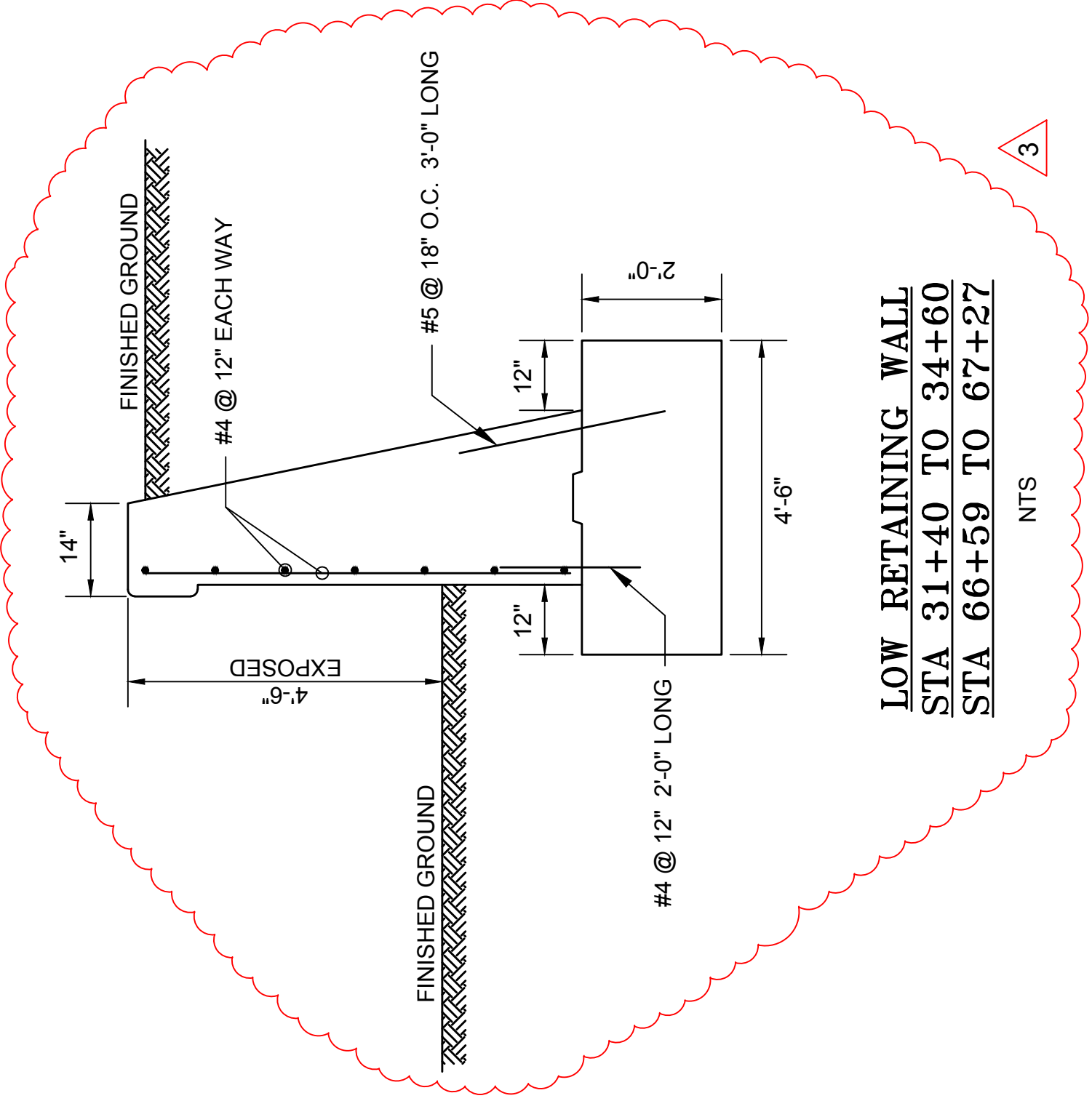
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	15	346
PROJECT FILE NO.		604428	

CONSTRUCTION DETAILS



CONCRETE BARRIER TRANSITION

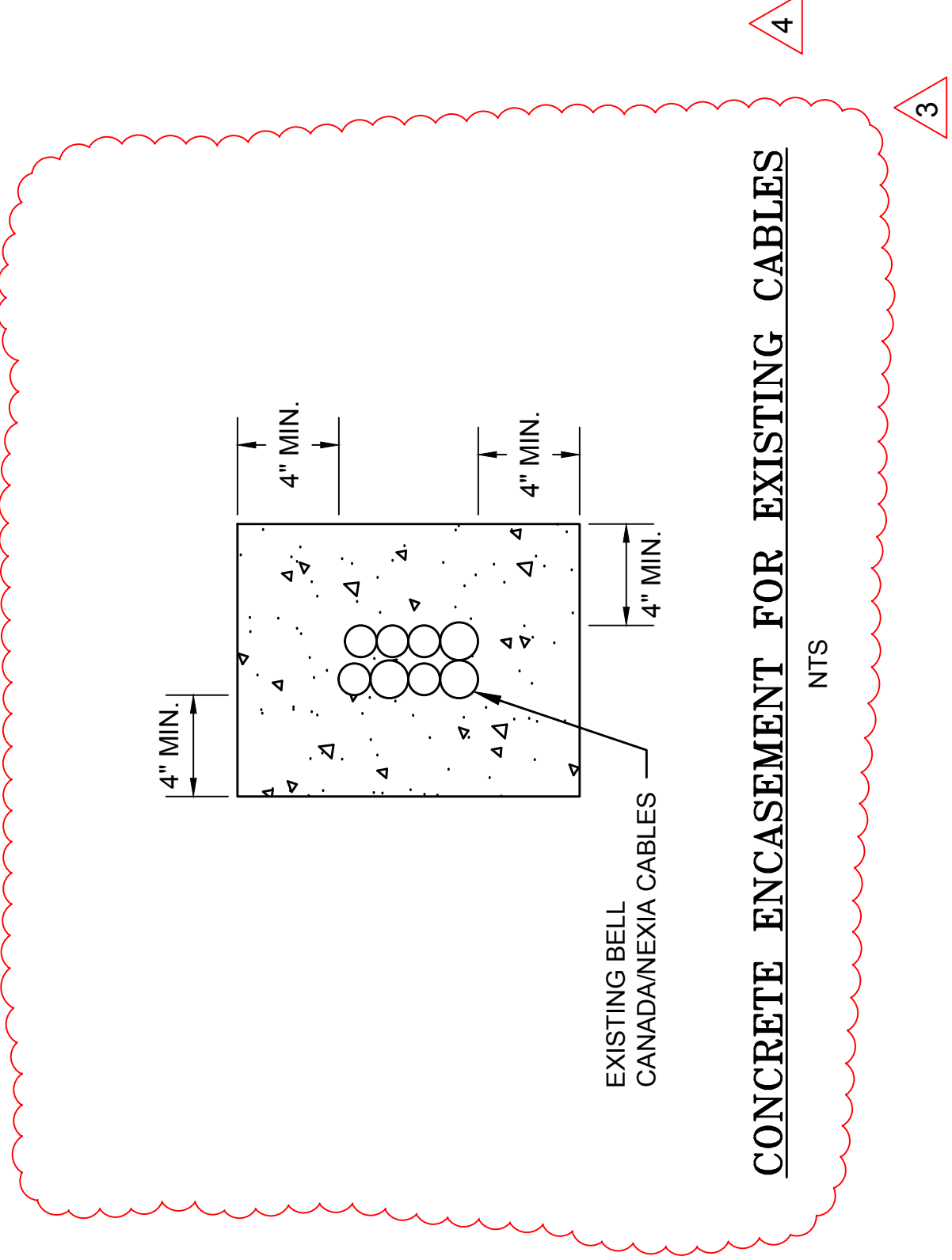
NTS



LOW RETAINING WALL  
STA 31+40 TO 34+60  
STA 66+59 TO 67+27

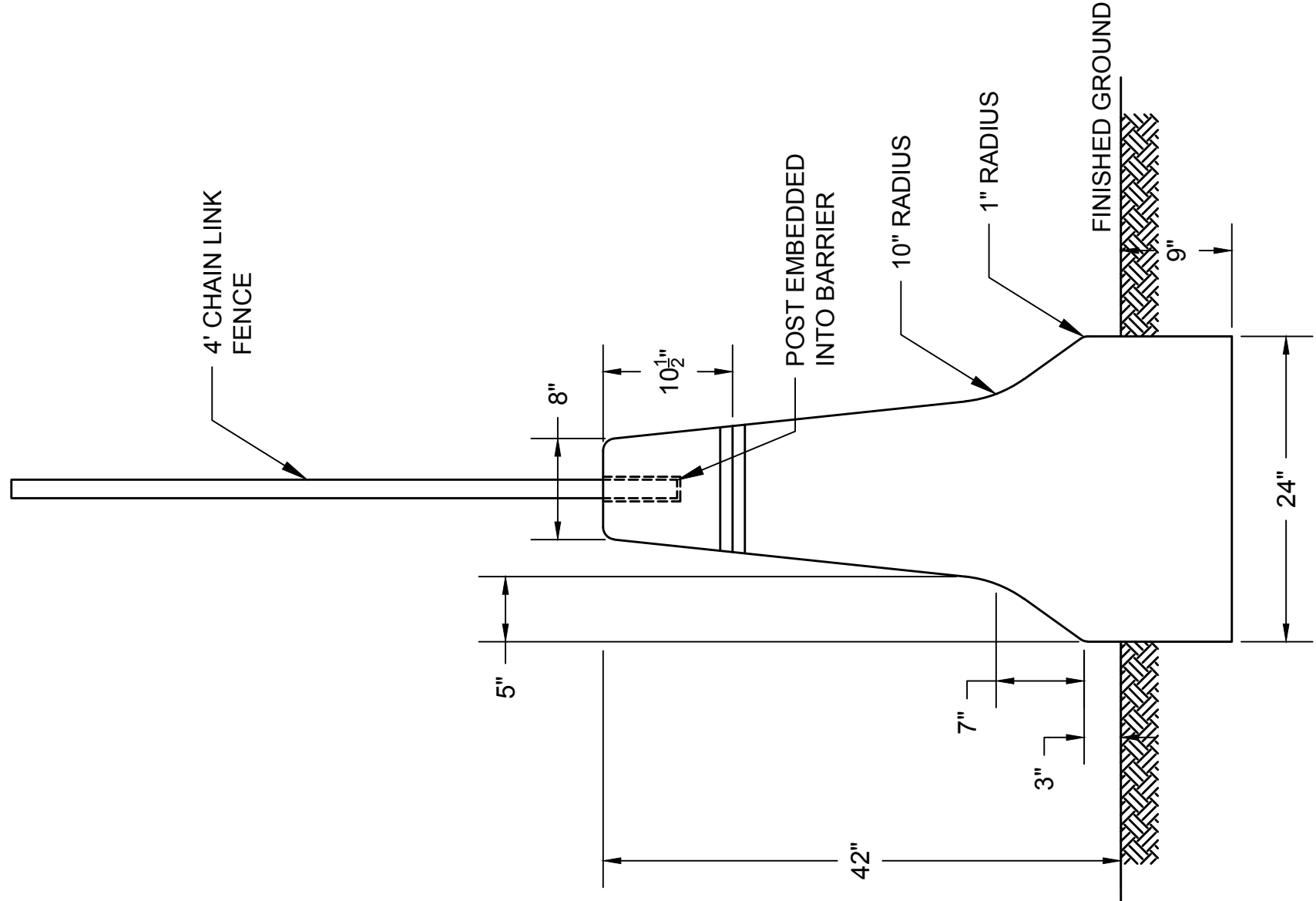
NTS

NOTE: LOW RETAINING WALL WILL BE PAID FOR UNDER ITEM 901 - 4000 PSI, 1.5 IN. 565 CEMENT CONCRETE. COST TO INCLUDE EXCAVATION AND REINFORCING STEEL FOR THE WALL.



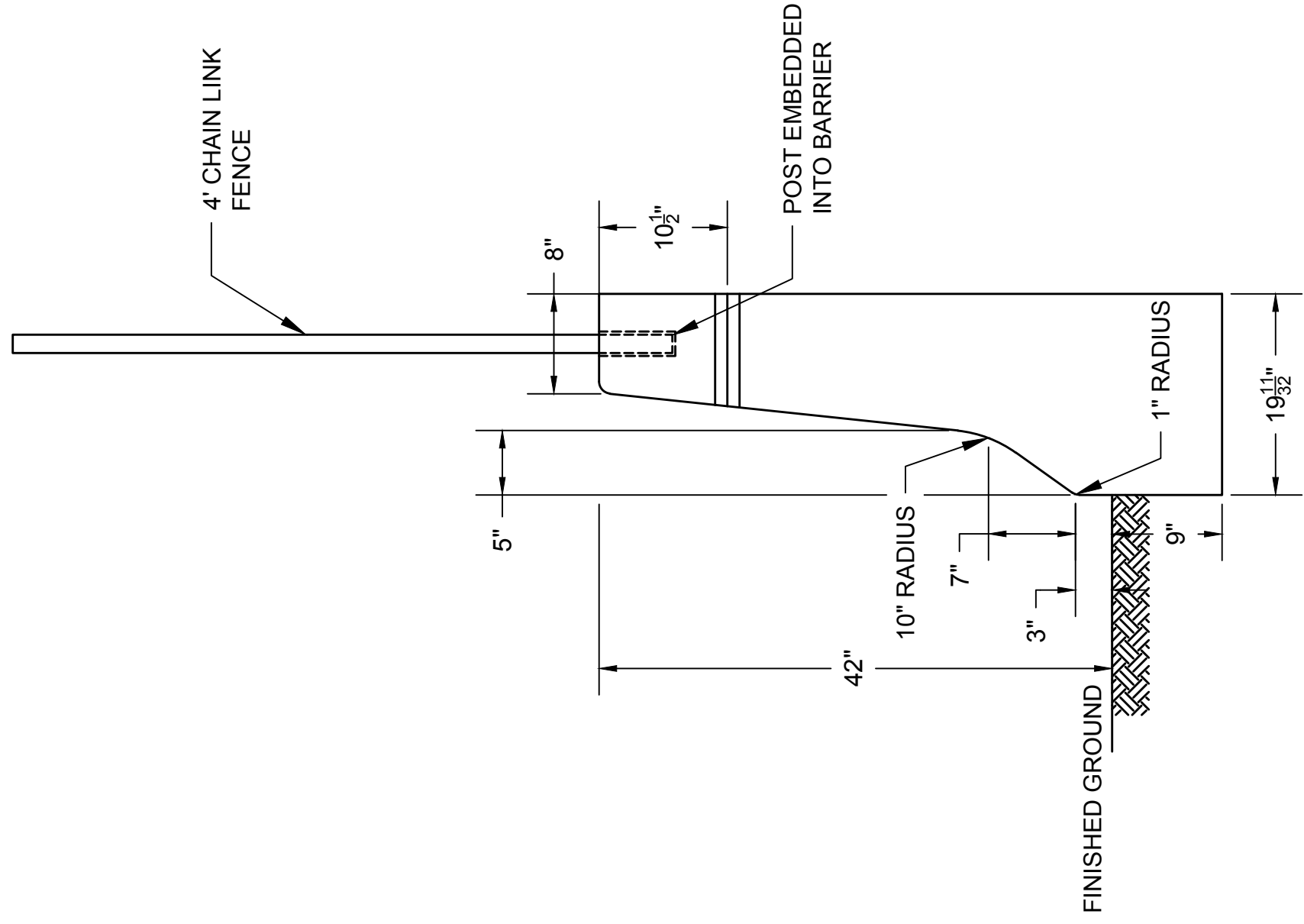
CONCRETE ENCASEMENT FOR EXISTING CABLES

NTS



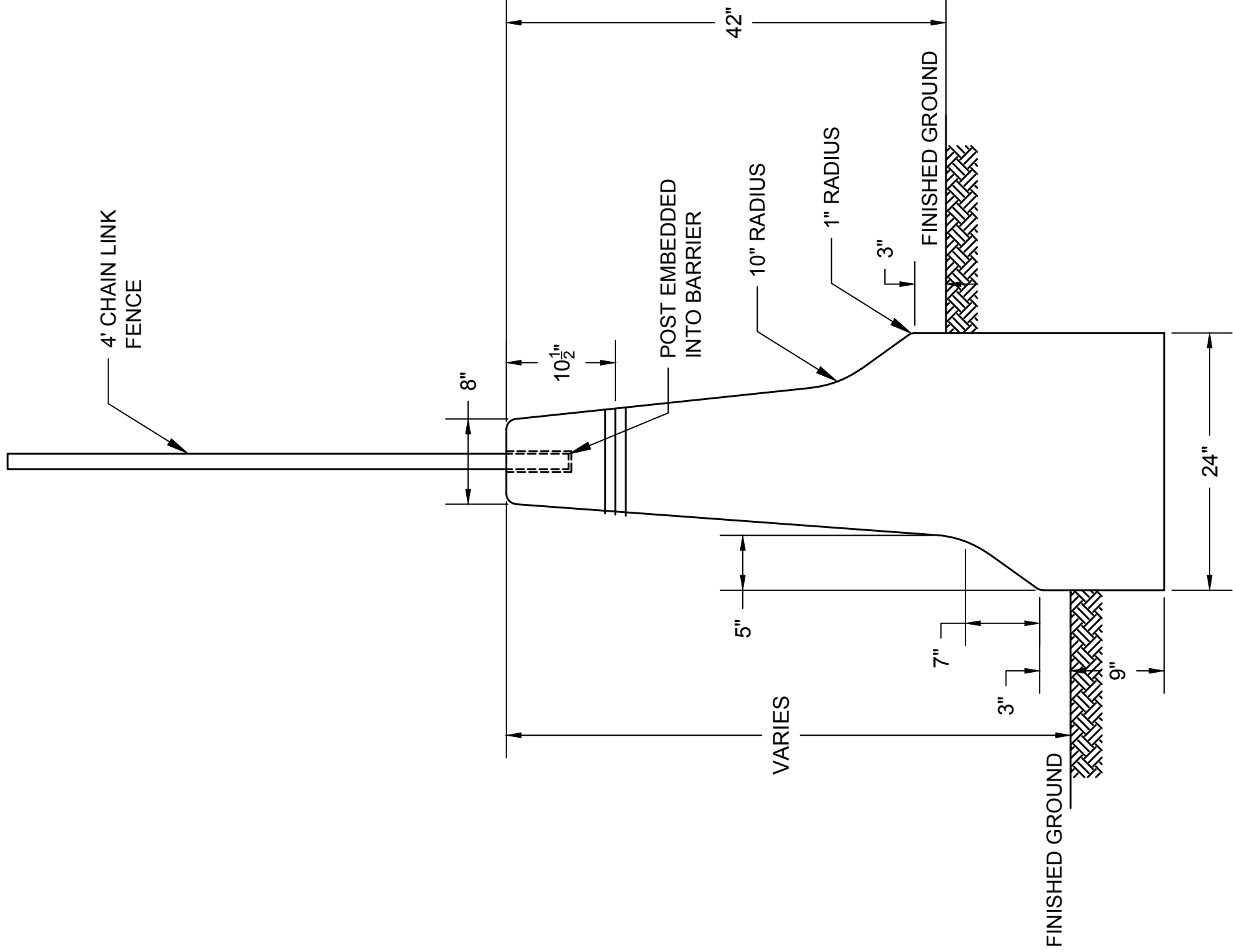
F-SHAPE CONCRETE BARRIER WITH 4' FENCE

NTS



F-SHAPE SINGLE FACED CONCRETE BARRIER WITH 4' FENCE

NTS



F-SHAPE ASYMMETRICAL CONCRETE BARRIER WITH 4' FENCE

NTS



CHELSEA SILVER LINE GATEWAY				
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	N/A	71	346	
PROJECT FILE NO. 604428				

DRAINAGE & UTILITY PLANS - BUSWAY

DRAINAGE STRUCTURE DATA							
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
1	CB	23+41	85.3' R	8.65	--	5.68	
2	CIT	23+52	75' R	10.0	5.40 (CB 1)	EXIST	CONVERT CB TO DMH
3	NOT USED						
4	CB	26+23	15' L	7.34	--	4.84	
5	CB	26+23	15' R	7.34	--	4.84	
6	DMH	26+41	3' R	7.65	4.44 (CB 4) 4.52 (CB 5)	4.44	

LIMIT OF WORK (PHASE 1)

STA 21+40.00

N: 2970007.5699

E: 780098.7538

SHEET NO. 72

CONTINUED ON

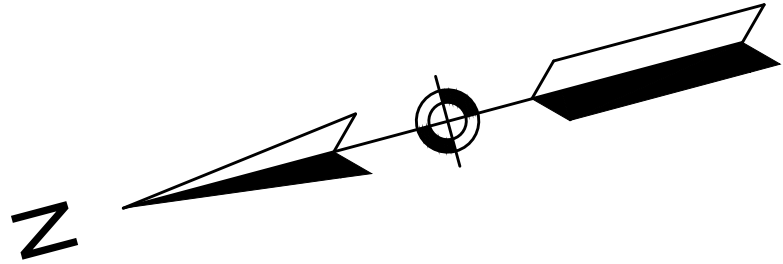


CHELSEA  
SILVER LINE GATEWAY

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	72	346
PROJECT FILE NO.		604428	

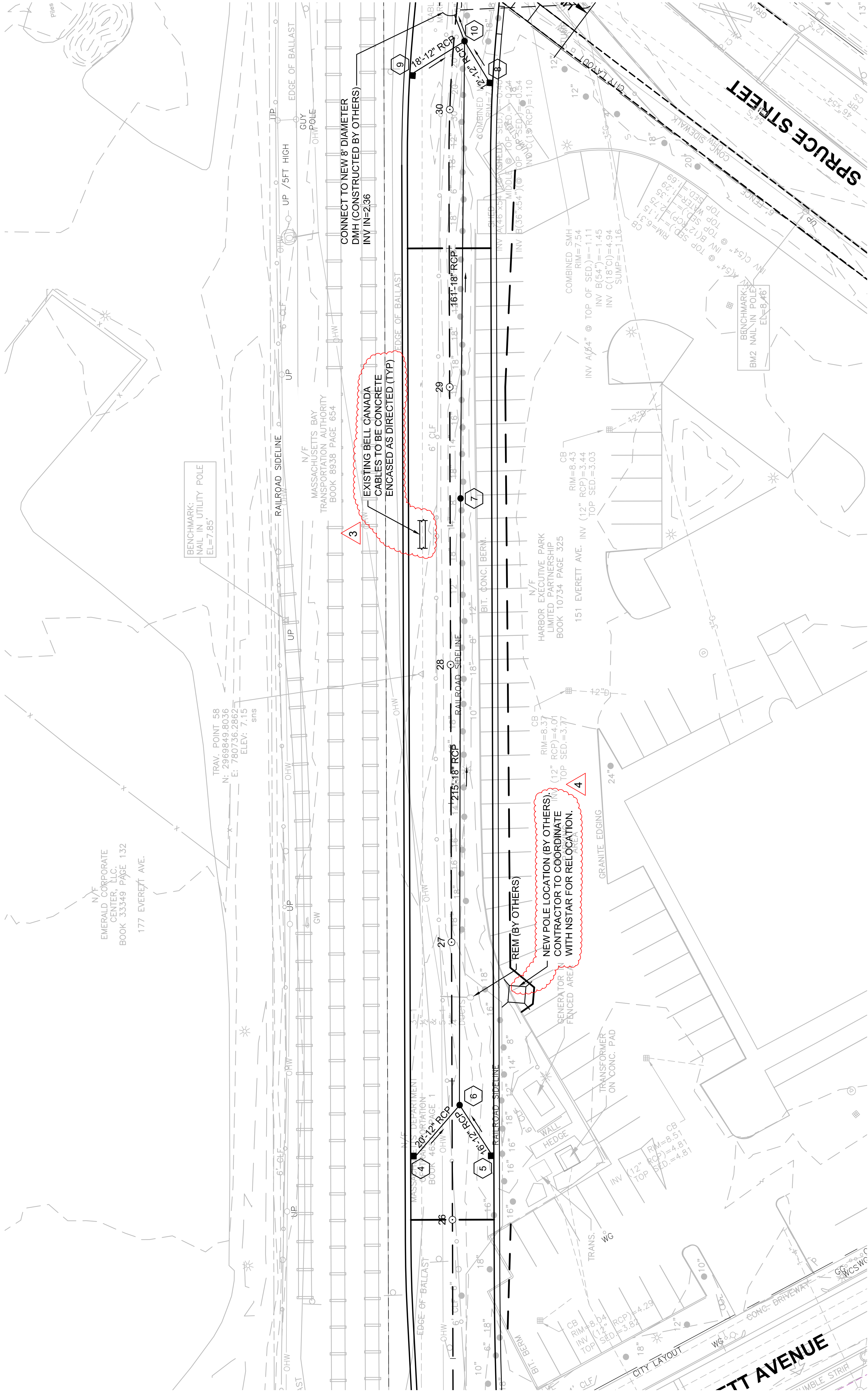
DRAINAGE & UTILITY PLANS - BUSWAY

DRAINAGE STRUCTURE DATA						
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN INV. ELEV. OUT	REMARKS
7	DMH	28+60	4' R	8.45	3.37	
8	CB	30+11	15' R	6.97	3.47	3
9	CB	30+11	15' L	6.97	3.47	
10	DMH	30+25	3.9' R	7.22	3.23 (CB 8) 3.23 (CB 9) 2.56 (DMH 7)	2.56



CONTINUED ON  
SHEET NO. 71

CONTINUED ON  
SHEET NO. 73



SCALE: 1" = 20'

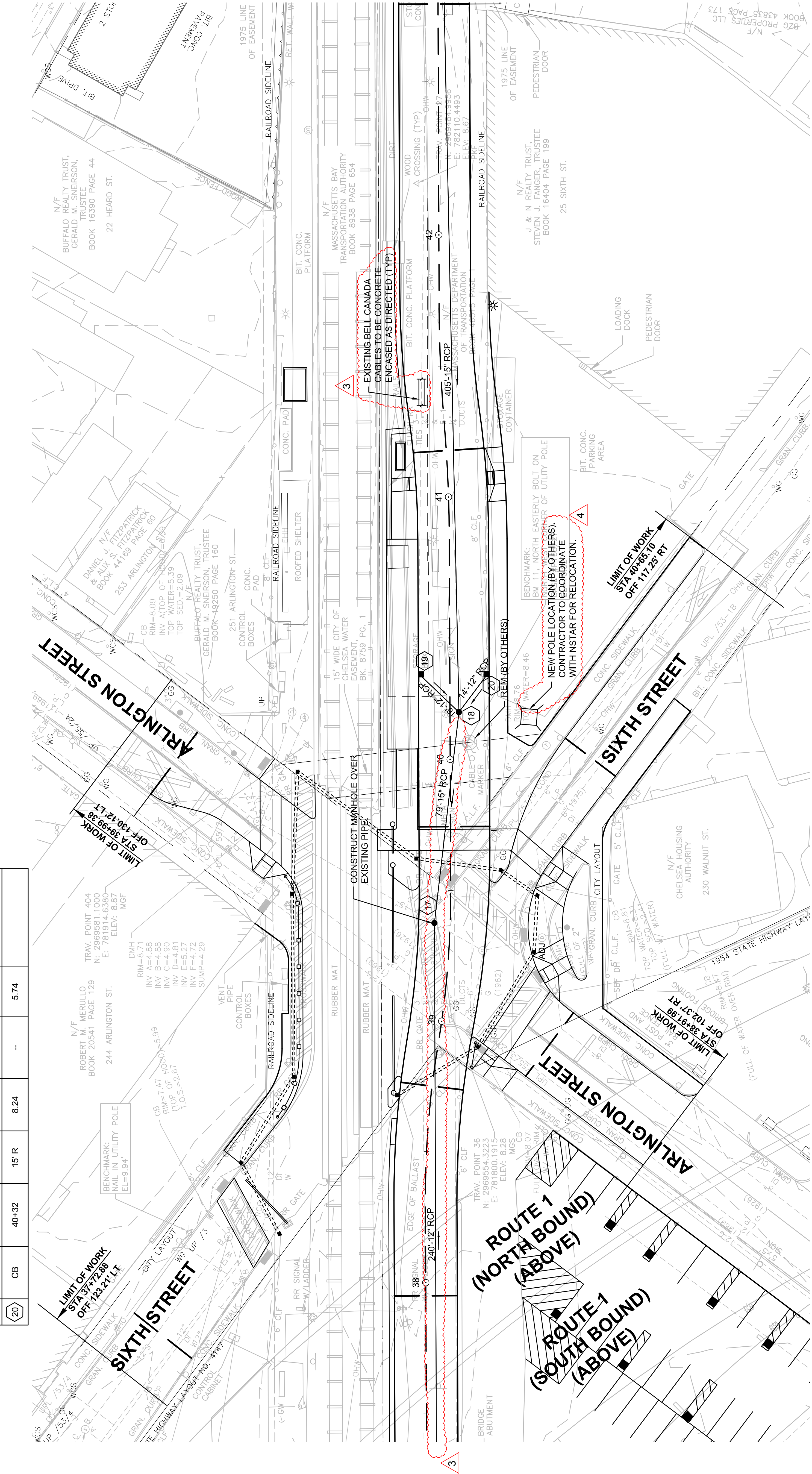


CHELSEA  
SILVER LINE GATEWAY

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	75	346
PROJECT FILE NO. 604428			

DRAINAGE & UTILITY PLANS - BUSWAY

DRAINAGE STRUCTURE DATA						
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN INV. ELEV. OUT	REMARKS
17	DMH	39+37	6' L	8.83	4.90 (DMH 16) 4.90 (DMH 18)	MH OVER EXISTING PIPE
18	DMH	40+18	3' R	8.55	5.48 (CB 19) 5.48 (CB 20) 5.48 (DMH 24)	
19	CB	40+32	12' L	8.30	5.80	
20	CB	40+32	15' R	8.24	5.74	



CONTINUED ON  
SHEET NO. 74

CONTINUED ON  
SHEET NO. 76



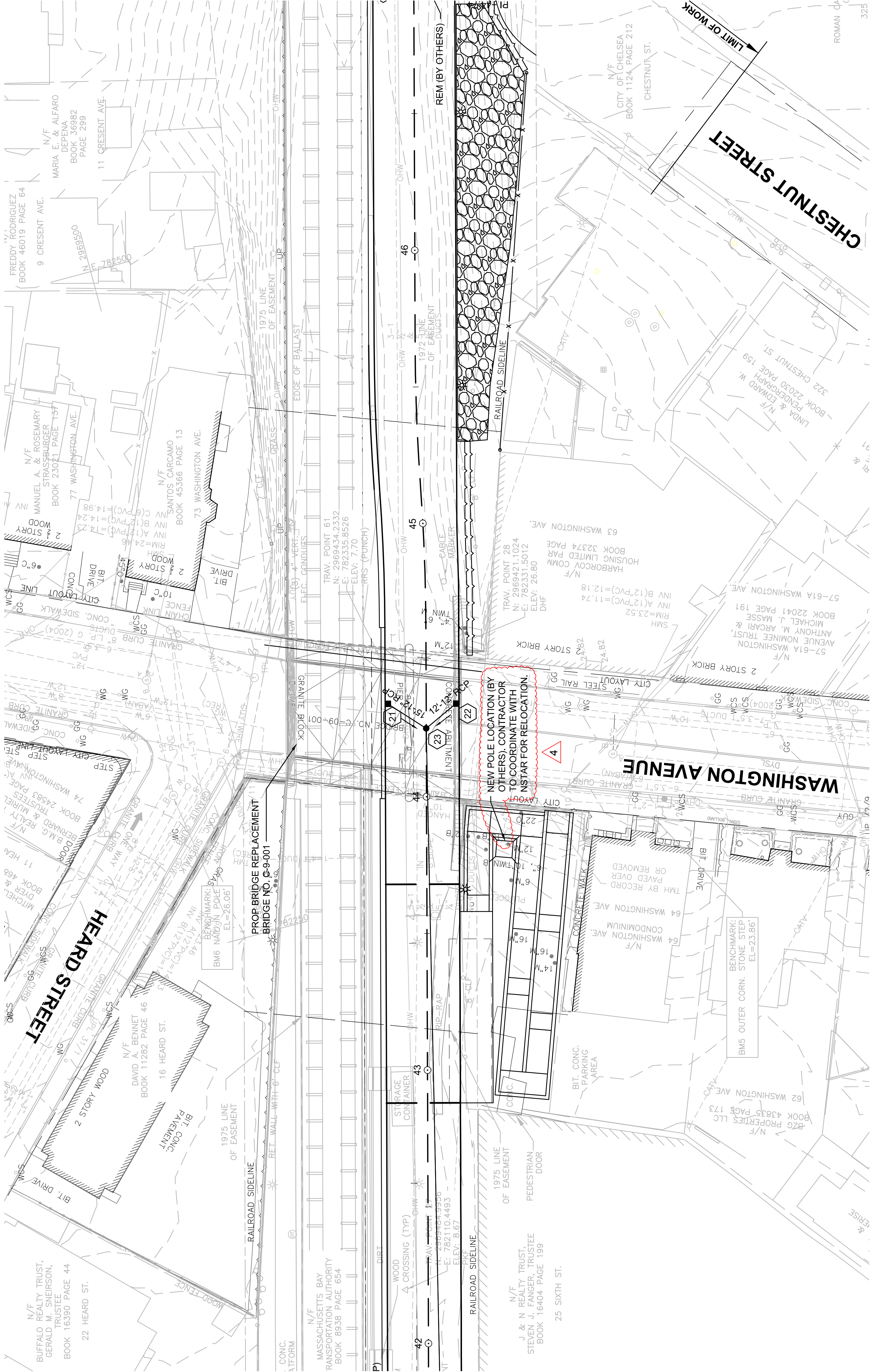
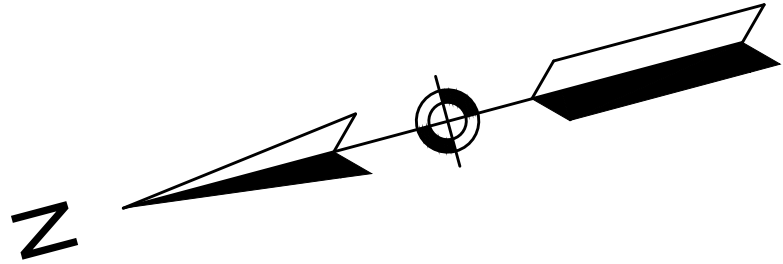


CHELSEA  
SILVER LINE GATEWAY

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	76	346
PROJECT FILE NO. 604428			

DRAINAGE & UTILITY PLANS - BUSWAY

DRAINAGE STRUCTURE DATA							
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
21	CB	44+34	15' L	8.71	--	6.21	
22	CB	44+34	12' R	8.71	--	6.21	
23	DMH	44+25	0' R	9.02	6.00 (CB 21) 6.00 (CB 22)	6.00	



CONTINUED ON  
SHEET NO. 75

CONTINUED ON  
SHEET NO. 77

NOTE:  
FOR WASHINGTON AVENUE DRAINAGE  
& UTILITY PLANS, SEE SHEET 85

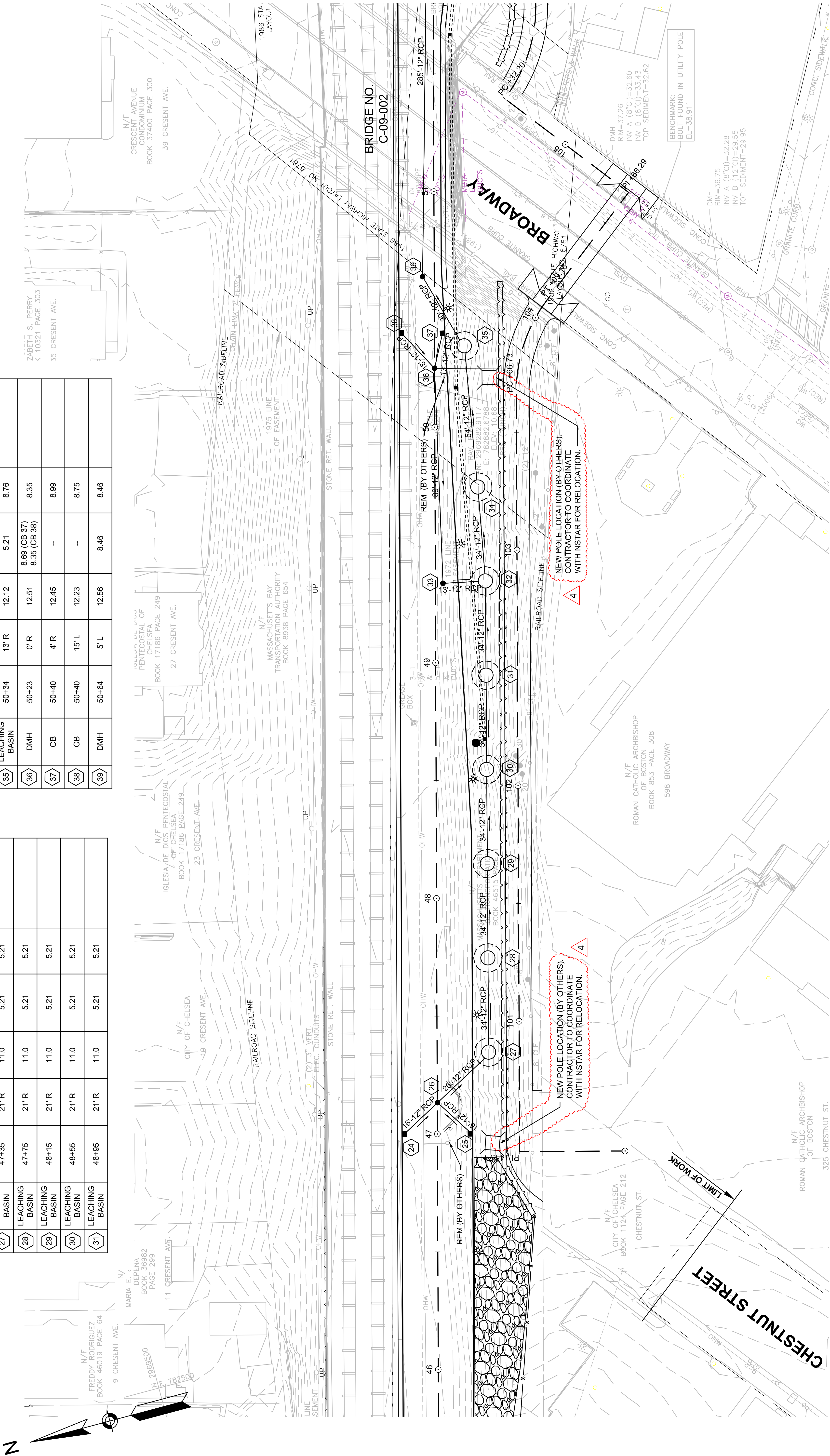


DRAINAGE STRUCTURE DATA						
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT
24	CB	47+00	15' L	10.20	--	6.70
25	CB	47+00	15' R	10.20	--	6.70
26	DMH	47+13	0' R	10.58	6.38 (CB 23) 6.38 (CB 24)	5.47
27	LEACHING BASIN	47+35	21' R	11.0	5.21	5.21
28	LEACHING BASIN	47+75	21' R	11.0	5.21	5.21
29	LEACHING BASIN	48+15	21' R	11.0	5.21	5.21
30	LEACHING BASIN	48+55	21' R	11.0	5.21	5.21
31	LEACHING BASIN	48+95	21' R	11.0	5.21	5.21

DRAINAGE STRUCTURE DATA (CONTINUED)						
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT
32	LEACHING BASIN	49+35	21' R	11.0	5.21 (LB 31) 7.16 (DMH 33)	5.21
33	DMH	49+34	3' R	11.84	7.29	7.29
34	LEACHING BASIN	49+75	18' R	11.0	5.21	5.21
35	LEACHING BASIN	50+34	13' R	12.12	5.21	8.76
36	DMH	50+23	0' R	12.51	8.69 (CB 37) 8.35 (CB 38)	8.35
37	CB	50+40	4' R	12.45	--	8.99
38	CB	50+40	15' L	12.23	--	8.75
39	DMH	50+64	5' L	12.56	8.46	8.46

CHELSEA SILVER LINE GATEWAY				
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	N/A	77	346	
PROJECT FILE NO. 604428				

DRAINAGE & UTILITY PLANS - BUSWAY



CONTINUED ON  
SHEET NO. 76

CONTINUED ON  
SHEET NO. 78







GENERAL NOTES

- THE INTENT OF THE STRUCTURAL DRAWINGS IS TO SHOW THE MAIN STRUCTURAL FEATURES AND DESIGN FOR THE COMPLETED PROJECT. ARCHITECTURAL DETAILS AND OTHER COMPONENTS THAT MAY BE NECESSARY TO CONTRACT CONSTRUCTION ARE SHOWN INCIDENTALLY, ONLY, AND NOT COMPLETELY. THEREFORE, ALL CONTRACTORS SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF ALL DIMENSIONS AND CONDITIONS OF THE PROJECT. DISCREPANCIES BETWEEN STRUCTURAL DRAWINGS AND ARCHITECTURAL DRAWINGS, IF NOT CLARIFIED IN THE ADDENDUM AT THE REQUEST OF THE CONTRACTOR, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT DURING CONSTRUCTION FOR CLARIFICATIONS. THE CONTRACTOR SHALL TAKE THIS INTO CONSIDERATION IN HIS BID.
- THE DESIGN IS IN ACCORDANCE WITH THE 8TH EDITION OF THE COMMONWEALTH OF MASSACHUSETTS STATE BUILDING CODE.
- THE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE SAFETY OF ADJACENT STRUCTURES, PROPERTY AND THE PUBLIC. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL STRUCTURES AGAINST DAMAGE DURING CONSTRUCTION.
- IN THE EVENT THAT THERE IS A CONFLICT BETWEEN ANY OF THE CODES OR STANDARDS REFERENCED ON THE CONTRACT DOCUMENTS THE STRICTER OR MORE CONSERVATIVE WILL CONTROL.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING, COORDINATING, AND VERIFYING ALL DIMENSIONS.
- WORK NOT INDICATED ON A PART OF THE DRAWINGS, BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT A CORRESPONDING LOCATION SHALL BE INCLUDED. DETAILS SHOWN ARE APPLICABLE TO ALL SIMILAR CONDITIONS.
- THE STRUCTURAL DESIGN IS BASED ON THE FULL INTERACTION OF ALL ITS COMPONENT PARTS. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL NECESSARY AND ADEQUATE PROVISIONS FOR STABILITY OF AND ALL TO THE STRUCTURE DUE TO ANY CAUSE DURING CONSTRUCTION.
- THE CONTRACTOR SHALL NOTIFY THE ARCHITECT WHEN IN THE COURSE OF CONSTRUCTION CONDITIONS ARE UNCOVERED WHICH ARE UNANTICIPATED OR OTHERWISE APPEAR TO PRESENT A DANGEROUS CONDITION.

DESIGN LOADS

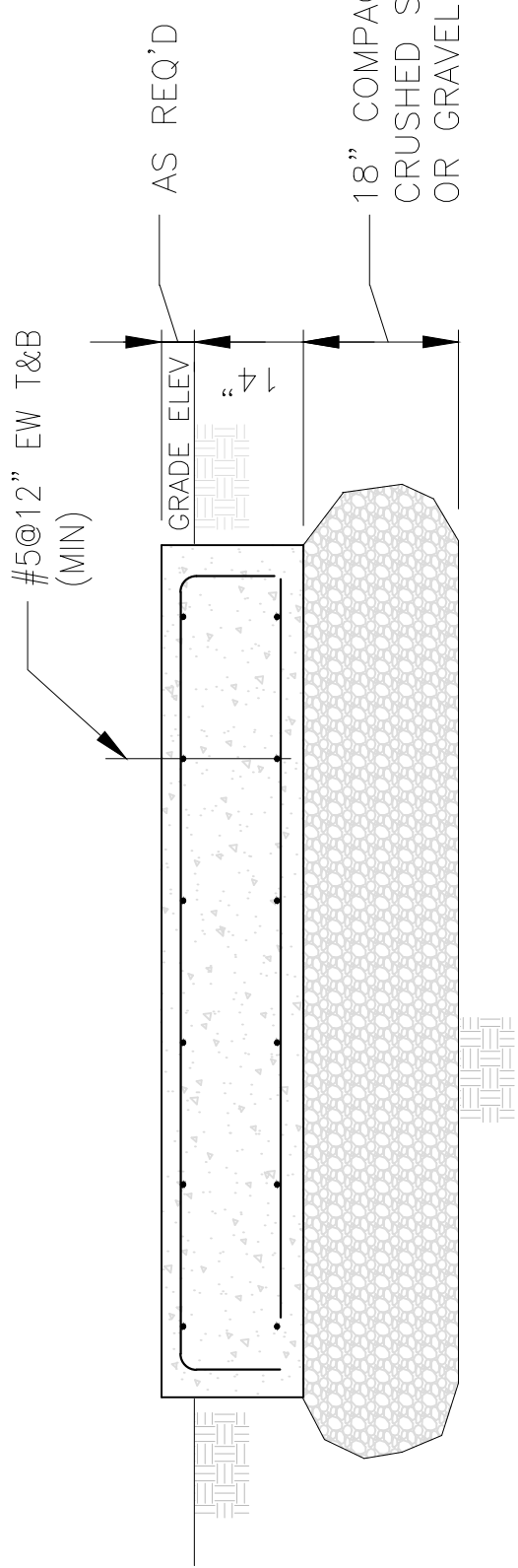
ROOF LIVE LOAD	.....	20 PSF
SNOW	.....	34 PSF + PLUS DRIFTS
WIND DESIGN	.....	IN ACCORDANCE WITH THE MASSACHUSETTS STATE BUILDING CODE
SEISMIC	.....	IN ACCORDANCE WITH THE MASSACHUSETTS STATE BUILDING CODE

FOUNDATIONS

- REFER TO GEOTECHNICAL DATA REPORT FOR SUBSURFACE INFORMATION AND DATA.
- DO NOT PLACE ANY FOUNDATION ELEMENT, FOOTING, BEAM OR WALL IN WATER OR ON FROZEN GROUND. THE USE OF CALCIUM CHLORIDE IS PROHIBITED.
- FOUNDATIONS ARE DESIGNED FOR AN ALLOWABLE BEARING PRESSURE OF 1.5 KSF.
- AGGREGATE PIER SOIL REINFORCEMENT IS REQUIRED BELOW THE CAST-IN-PLACE CONCRETE UPRIGHT FOUNDATIONS FOR THE CANOPY STRUCTURES AT THE MYSTIC WALL, DOWNTOWN CHELSEA AND EASTERN AVENUE BUS RAPID TRANSIT (BRT) STATIONS. THE AGGREGATE PIER GROUND IMPROVEMENT SHALL BE DESIGNED AND CONSTRUCTED BY A SPECIALTY CONTRACTOR AS A PERFORMANCE BASED SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS. THE PERFORMANCE REQUIREMENTS ARE TO LIMIT SETTLEMENT OF EACH CANOPY STRUCTURE FOOTING TO LESS THAN 1 INCH AND A DIFFERENTIAL SETTLEMENT OF LESS THAN 1/8 INCH BETWEEN EACH FOOTING WITH THE DEPTH OF GROUND IMPROVEMENT EXTENDING AT LEAST 2 TIMES THE WIDTH OF THE FOOTING BELOW THE BOTTOM OF THE FOOTING.

REINFORCED CONCRETE

- CONCRETE CONSTRUCTION WILL CONFORM TO THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-08) AND TO ACI 301.
- CONCRETE QUALITY IN ACCORDANCE WITH THE REQUIREMENTS OF THESE DRAWINGS AND SPECIFICATIONS IS ESSENTIAL TO THE STRUCTURAL PERFORMANCE OF THIS STRUCTURE. CONCRETE THAT IS NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS WILL NOT BE ACCEPTED.  
  
ALL CONCRETE SHALL BE CONTROLLED CONCRETE, MIXED AND PLACED UNDER THE SUPERVISION OF AN APPROVED CONCRETE TESTING AGENCY. ALL CONCRETE SHALL BE STONE AGGREGATE, EXCEPT AS INDICATED, AND SHALL DEVELOP THE FOLLOWING STRENGTH AT 28 DAYS:  
  
A. EXTERIOR CONCRETE (AIR-ENTRAINED): 5000 PSI NORMAL WEIGHT.  
ALL CONCRETE THAT IS EXPOSED TO THE WEATHER SHALL CONTAIN AN AIR ENTRAINMENT ADMIXTURE.  
  
CONCRETE MUST REACH THE FOLLOWING PERCENTAGES OF ITS 28-DAY COMPRESSIVE STRENGTH (f<sub>c</sub>) BEFORE FORMS OR SHORES MAY BE REMOVED.  
  
A. WALLS FOR CANTILEVERS: 90%  
B. CANTILEVER ROOF SLABS: 90%  
C. OTHER WALLS: 50%  
D. OTHER ROOF SLABS: 80%



A TYPICAL DETAIL CONC PAD/MAT

Scale: 1/2"=1'-0"

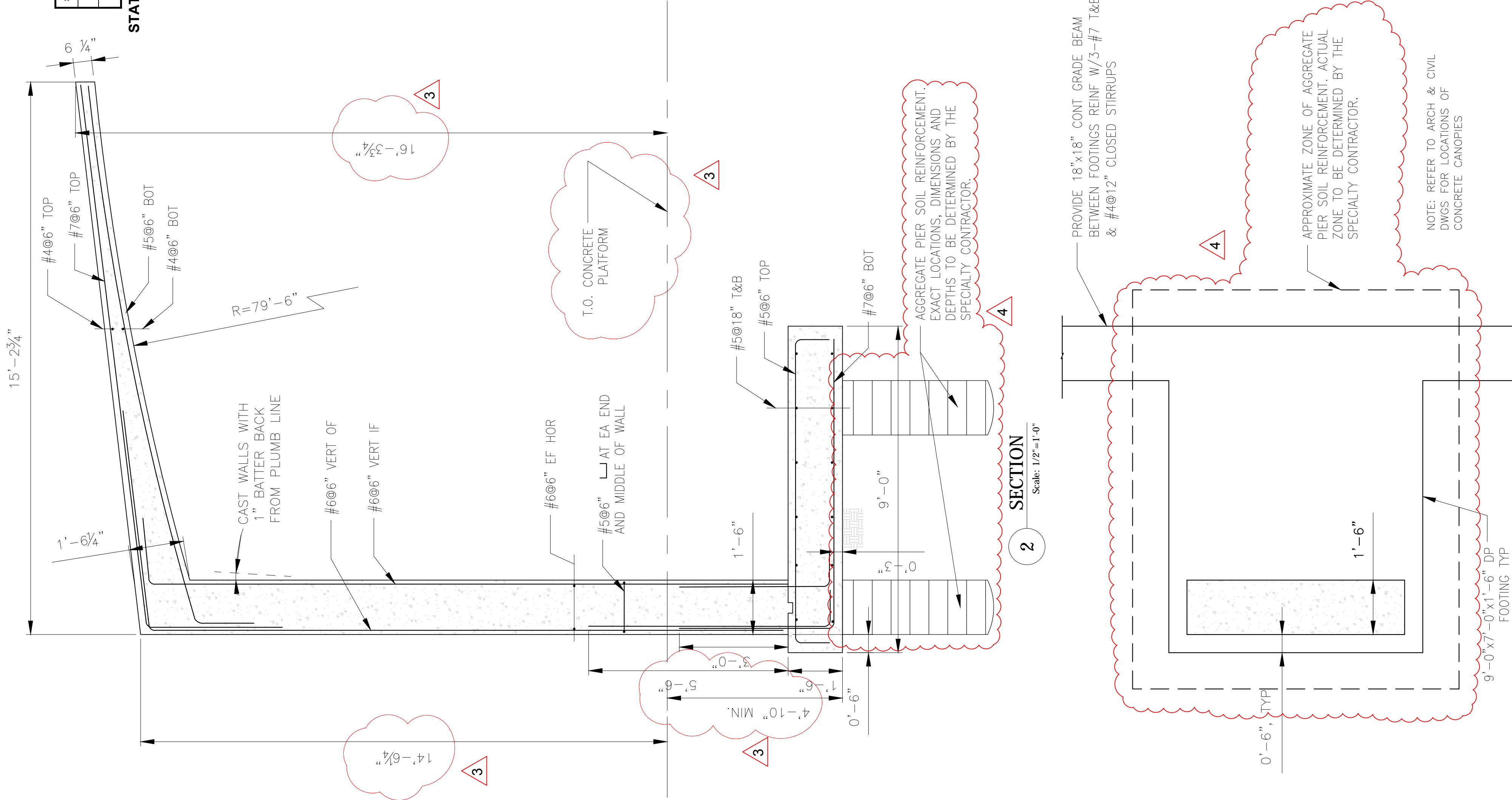
REINFORCED CONCRETE CONT.

- REINFORCING BARS SHALL CONFORM TO ASTM A615 WITH 60,000 PSI YIELD STRENGTH, AS INDICATED AND SHALL HAVE THE FOLLOWING CONCRETE COVER, UNLESS NOTED OTHERWISE ON THE DRAWINGS:  
  
A. SURFACES PLACED IN CONTACT WITH THE GROUND 3"  
B. FORMED SURFACE EXPOSED TO GROUND 2"  
C. PRIMARY REINFORCING EXPOSED TO WEATHER 2"  
D. TIES (#4) EXPOSED TO GROUND OR WEATHER 1 1/2"
- PROVIDE CLASS B SPLICE FOR ALL CONTINUOUS REINFORCEMENT, UNLESS OTHERWISE INDICATED. 30. MINIMUM ANCHORAGE AND SPLICE REQUIREMENTS FOR REINFORCING BARS SHALL BE ACCORDING TO ACI 318
- IN SLABS AND BEAMS, LAP CONTINUOUS BOTTOM REINFORCEMENT AT SUPPORTS AND CONTINUOUS TOP REINFORCEMENT AT ENDS.
- PROVIDE BAR SUPPORTS, SPACERS AND ACCESSORIES RECOMMENDED IN THE ACI DETAILING MANUAL 1988, PUBLICATION SP-66. ALL REINFORCEMENT DETAILING, LAP SPLICES AND EMBEDMENT WILL CONFORM TO THIS MANUAL. ALL ACCESSORIES, SUCH AS SLAB BOLSTERS AND BEAM AND SLAB CHAIRS IN CONTACT WITH EXPOSED SURFACES WILL BE PLASTIC-COATED.
- PROVIDE TEMPERATURE REINFORCEMENT IN ALL CONCRETE MATS AND SLABS AND WALL IN ACCORDANCE WITH ACI 318, UNLESS OTHERWISE SHOWN ON DRAWINGS.
- DETAILING OF REINFORCEMENT SHALL BE ACCORDING TO THE LATEST EDITION OF ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
- ALL REINFORCING WILL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS.
- PROVIDE DOWELS IN FOOTING TO MATCH WALL REINFORCEMENT. SET AND TIE ALL REINFORCEMENT BEFORE PLACING CONCRETE. SETTING DOWELS AND REINFORCEMENT INTO WET CONCRETE IS PROHIBITED.
- WELDED WIRE FABRIC WILL CONFORM TO ASTM A185. LAP TWO SQUARES AT ALL SPLICES AND TIE AT 3-FOOT CENTERS.
- NO CONCRETE SHALL BE CAST BEFORE REVIEW AND APPROVAL OF THE REINFORCING AND EMBEDDED ITEMS HAS BEEN OBTAINED FROM THE ARCHITECT.
- LOCATE CONSTRUCTION JOINTS IN ROOFS NEAR THE THIRD POINTS OF THE SPANS OF SLABS
- ALL KEYS SHALL BE 2"x6" (NOMINAL) UNLESS SHOWN OTHERWISE ON DRAWINGS.
- EXPOSED EDGE OF CONCRETE ELEMENTS, WILL HAVE 3/4-INCH CHAMFER.
- CONCRETE FINISH WILL BE AS SPECIFIED IN SECTION 03300; CAST-IN-PLACE CONCRETE.
- NOT ALL OPENINGS THROUGH CONCRETE SLABS AND WALLS ARE SHOWN ON STRUCTURAL DRAWINGS. ALL WELDED REQUIRED INSERTS, SLEEVES, CONDUITS, EMBEDMENTS, AND PENETRATIONS MUST BE VERIFIED WITH RESPECTIVE TRADES BEFORE CASTING CONCRETE.
- PIPES OR CONDUITS PLACED IN CONCRETE SHALL NOT BE PLACED CLOSER THAN 3/8 DIAMETERS OR WIDTHS ON CENTER AND SHALL HAVE AN OUTSIDE DIAMETER LESS THAN 1/2 OF THE SLAB THICKNESS. ALUMINUM CONDUITS SHALL NOT BE PLACED IN CONCRETE.
- FLOOR AND ROOF SLOPES WILL BE AN INTEGRAL PART OF STRUCTURAL SLABS. SEPARATE CONCRETE FILL IS NOT PERMITTED UNLESS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS.
- SEE ARCHITECTURAL DRAWINGS FOR FINISHES, DEPRESSIONS, REGLETS, NOTCHES AND OTHER ARCHITECTURAL FEATURES. ALL CONCRETE EXPOSED TO PUBLIC SHALL BE CONSIDERED ARCHITECTURALLY EXPOSED CONCRETE.
- PROVIDE SEALANT JOINT FOR ALL EXPOSED TO VIEW CONSTRUCTION JOINTS, CONTROL JOINTS AND SHEAR KEYS.
- COORDINATE AND SET EMBEDDED PLATES REQUIRED FOR CONNECTION OF WORK BY OTHERS.
- PROVIDE CONCRETE PADS FOR MECHANICAL EQUIPMENT AND PREENGINEERED PASSENGER SHELTERS ACCORDING TO THE REQUIREMENTS OF THE MANUFACTURER AND IN ACCORDANCE WITH THE TYPICAL DETAILS. ALWAYS PROVIDE MINIMUM REINFORCEMENT FOR PADS, UNLESS NOTED OTHERWISE. COORDINATE LOCATIONS WITH ARCHITECTURAL, CIVIL AND MECHANICAL DRAWINGS.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR TESTING AGENCY THAT REINFORCEMENT IS COMPLETE AND READY FOR INSPECTION AT LEAST 24 HRS IN ADVANCE OF CONCRETE PLACEMENT PRIOR TO REQUESTING INSPECTION OF REINFORCING. THE CONTRACTOR SHALL HAVE COMPLETED ALL NECESSARY WORK INCLUDING THE WORK OF THE TRADES.

CHELSEA  
SILVER LINE GATEWAY

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	212	346
PROJECT FILE NO.		604428	

STATION PLANS, SECTIONS, ELEVATIONS



FOOTING PLAN @ CANTILEVER

Scale: 1/4"=1'-0"